PROPERTY DESCRIPTION

BACKGROUND AND AFFECTED ENVIRONMENT

PROPERTY DESCRIPTION

PROPERTY OVERVIEW

The Black River State Forest is located in central Wisconsin in the Eastern Broadleaf Forest Province which occupies the southern half of the state. The Black River State Forest was established in 1957 after the federal government conveyed 59,000 acres of forest land to the Wisconsin Conservation Department in 1955. Through further land purchases, the forest has grown to its present size of 68,237 acres. The original area within the Black River State Forest, which consisted primarily of white pine and red pine, was heavily logged between 1880 and 1895 and was later settled by homesteaders seeking farmland. Today the forest consists of a mix of jack pine, oak, and aspen with an increasing component of white pine in the understory and canopy. The state forest provides hunting for whitetail deer, Ruffed Grouse, Wild Turkey, waterfowl, bear, and a variety of small game. Fishing is also popular on the Black River, East Fork of the Black River and on various flowages found throughout the state forest. In addition, the property provides a breadth of recreational opportunities such as cross-country skiing, hiking, camping, horseback riding, and motorized trails.

PAST MANAGEMENT AND USE

During the late 1930s the Resettlement Administration, using Works Project Administration labor, began a project to develop a series of earthen dikes within the forest. This included setting up a small sawmill in the area where they produced and assembled oak sheet piling for the core of every earthen dike in the state forest area. This project changed the hydrology of the area by creating large shallow impoundments within the wetland complex of the state forest. Over 90% of the impoundments created during this time are still present on the state forest today.

A log shelter and home were built in 1938 by the Civilian Conservation Corps at the Castle Mound Roadside Park. A service building was added in 1958 and soon after a loop campground with toilets and an observation tower were built. By 1966, annual attendance at the Black River State Forest was 100,000. Today, over 300,000 visitors use the forest annually (WDNR 2004).

The arrival of snowmobiles brought a new type of recreation to the forest and in 1967 a 14 mile loop trail was constructed. Today there are nearly 48 miles of motorized trails that link with an extensive county trail network. With the advent of the ATV in the 1970s, this new recreational use was permitted on 33 miles of the existing snowmobile trail system. Today, ATVs have become one of the fastest growing recreation activities in Wisconsin and on the state forest.

The construction of Interstate 94 contributed to the development of Robinson Beach. The need for sand resulted in the digging of an 11 acre clear water pond in 1968.

When cross-country skiing became popular in the early 1970s, a 14 mile trail was developed. Another 10 miles were added in 1981. Today, the trails are also used for backpacking, hiking and mountain biking. The Black River State Forest also contains three nature trails, one located at each campground.

The area which now comprises the state forest was heavily logged during Wisconsin's cutover period from the mid-1800s through the early 1900s. White and red pine were the most heavily logged species. The cutover eventually led to a focus on forest conservation and the establishment of many state and national forests. Today, the area is much more heavily forested as a result of natural regeneration, tree planting, and fire suppression.

PHYSICAL ENVIRONMENT

Geology

The Black River State Forest landscape lies within an area that was strongly influenced by glaciations during the Ice Age. The Ice Age began about 2.5 million years ago, and was a time when glaciers repeatedly formed, expanded, and retreated. The most recent ice advance into this area occurred during the latter part of the Wisconsin Glaciation. Twenty-six thousand years ago, a large ice sheet expanded through Canada and moved into the Lake Superior and Lake Michigan basins. The ice reached its maximum southerly extent in Wisconsin about 18,000 years ago, and then gradually retreated back out of the Lake Superior basin about 9,500 years ago. The Wisconsin

Glaciation was responsible for creating many of the surface formations found in the vicinity of the BRSF, although the area was not in direct contact with the ice sheets, and prior glaciations are also thought to have influenced the surficial geology of the area.

Glacial Lake Wisconsin occupied a large area just to the east of the state forest between 14,000 and 19,000 years ago. During most of the time the lake existed, glacial meltwater drained through the lowland now occupied by the East Fork of the Black River, and through the Black River valley to the Mississippi River. Most of the former drainage channels have been obscured by deposits of post-glacial sediments, so their exact location is uncertain. Drainage through these channels built outwash terraces and fans, shaping the topography along the Black River and the East Fork.

Earlier glacial lakes, formed by glaciers that preceded the Wisconsin Glaciation, are believed to have built lake plains and other drainage features in the state forest area. The large sand plain that makes up most of the property, known as the Jackson Plain, may have been covered by one or more large glacial lakes prior to 130,000 years ago. Possible drainage outlets for these lakes are located in eastern Jackson County near Eleva Station.

After the Wisconsin Glaciation, and before vegetation covered the land, there was little to impede strong winds throughout the region. The sandy surfaces of the lake plains and outwash terraces were easily moved about, and many aeolian dune features were built by wind action. Also protruding above the sand plain are remnants of eroded Cambrian sandstone, forming buttes, hills, knolls, ridges, and pediments. Castle Mound and Wildcat Mound are examples of landscape features formed by Upper Cambrian sandstone.

Upper Cambrian sandstone is also exposed along the banks of the Black River and the East Fork of the Black River, outcropping as low ledges or cliffs. Precambrian-age igneous and metamorphic rock is exposed at rapids along these rivers upstream from Black River Falls; these are some of the southernmost exposures of Precambrian rocks in Wisconsin.

Soils

Upland soils on the Black River State Forest are primarily sands, sandy loams, and grayish brown unglaciated silt loams, derived from glacial lakebed and outwash deposits and erosion of sandstone bedrock. They are generally acidic, infertile, and prone to drought; the sands of this area are among the most sterile soils in the state. Extensive areas of organic soils (peats and mucks) are associated with the area's abundant wetlands. Terraces along the Black River include localized areas of silts and other fine-textured soils, but these make up a small part of the forest. Where the water table is close to the surface, small changes in elevation can result in a wide range of local soil moisture conditions.

The majority of soils found within the Black River State Forest belong to one of three soil associations that group soil series with similar properties. These associations are the Tarr-Boone-Rockdam Association, the Elm Lake-Fairchild Association, and the Iron Run-Ponycreek-Dawsil Association. All of these associations present unique suitability limitations for various uses based on slope, water holding capacity and texture as well as chemistry and engineering indices.

The Tarr-Boone-Rockdam Association is made up of moderately well to excessively drained sandy soils formed in siliceous sandy alluvium or siliceous residuum derived from sandstone. They are found on nearly level to very steep sites and have an available water holding capacity that is low to very low. These soils are generally better suited for pine tree growth as hardwood trees generally grow slowly and are of poor shape when on these soils. Restrictive soil features for recreational development are ranked as "severe" (on a scale of slight, moderate, or severe) for all soils within this association primarily due to the sandy and acidic nature of these soils. The nearly level to gently sloping areas are generally well suited for dwellings however, are poorly suited to septic tank absorption fields because they do not adequately filter the effluent.

The Elm Lake-Fairchild Association is made up of poorly drained and somewhat poorly drained sandy and mucky soils formed in siliceous sandy alluvium and loamy residuum derived from the underlining interbedded sandstone and shale. They are found on nearly level and gently sloping sites and have a low water holding capacity. The Elm Lake soils in this association are suited to conifers but are poorly suited to most other trees because of the wetness. The Fairchild soils of this association are suited to trees. Restrictive soil features for recreational development are ranked as "severe" for all soils within this association primarily due to wetness and the sandy acidic nature of these soils. This association is generally poorly suited to unsuited for septic tank absorption fields and dwellings mainly because of the wetness and the thin soil layer over bedrock.

The Iron Run-Ponycreek-Dawsil Association is made up of somewhat poorly drained to very poorly drained sandy, mucky, and peaty soils. The Iron Run and Pony Creek soils are formed in siliceous sandy alluvium and the Dawsil soils are formed in organic material overlaying siliceous sandy alluvium. They are found on nearly level and gently sloping sites with Iron Run and Pony Creek soils having available water holding capacity that is

TABLE 3.1 IMPOUNDMENTS LOCATED WITHIN THE BLACK RIVER STATE FOREST

Name	Description	Maximum Depth	Access
Battle Point Flowage	A very soft water drainage impoundment. The water has a medium brown color, is acid, and has a low transparency.	7 feet	There is public access from Battlepoint Road.
Black Duck Flowage	A soft water drainage impoundment. The water has a light brown color, is acid, and has a low transparency. It is not managed for fish. Mallards and wood ducks nest at the flowage.	7.5 feet	It is managed for waterfowl but there is public access by foot.
Dry Land Flowage	A drained lake having very soft water. It is acid and the water has a light brown color and a low transparency. It is managed for waterfowl. During dry weather periods the flowage has very little water area.	5 feet	It has unimproved access
Funmaker Flowage	A soft water drainage impoundment. The water has a light brown color, low transparency, and a neutral pH. Beaver, waterfowl, and big game frequent the flowage.	3 feet	It has an unimproved access. Gated approximately 400 yards prior to the flowage; however, access can be garnered by foot.
Little Bear Flowage	A soft water drainage impoundment located on Dickey Creek. The water has a medium brown color, is alkaline, and has a low transparency. The flowage is used in waterfowl management.	5 feet	There is unimproved access.
Big Bear Flowage	A very soft water drainage impoundment (7 acres) on Dickey Creek. The water is medium brown, slightly acidic, with low transparency. The flowage is managed for waterfowl.	6 feet	There is unimproved access.
Little Thunder Flowage	A drainage impoundment. The water is very soft, alkaline, has a dark brown color, and a low transparency. The flowage is managed for waterfowl.	3 feet	There is a graveled parking area.
Mallard Flowage	A drainage impoundment. The water is a very soft, slightly acid, medium brown color and a low transparency. The lake is managed for waterfowl.	4.5 feet	There is unimproved access.
Partridge Crop Flowage	A very soft water drainage impoundment located on a ditch. It has medium brown colored water, a low transparency, and it is slightly alkaline. The flowage is managed for waterfowl.	3.5 feet	There is access from a state trail.
Pigeon Creek Flowage	A soft water drainage impoundment located on Pigeon Creek. The water is alkaline, has a low transparency, and a medium brown color.	9 feet	There is a multiple use access which includes a boat launch, swimming, picnic area, and campground.
Seventeen Flowage	A very soft water drainage impoundment located on a ditch system within the forest. The water is alkaline, has a light brown color, and a low transparency.	4 feet	There is no public access to the flowage.
Squaw Mound Flowage	A soft water drainage impoundment. The water is alkaline and has a medium brown color. It is located on Levis Creek in the state forest.	6.5 feet	There is public access with parking. However, there is a gate prior to the waterway; must walk a short distance to access.
Staffon Lake Flowage	A soft water drainage impoundment located on Hay Creek within the state forest. The water is acidic, has a light brown color and low transparency.	1.2 feet	There is public access and parking.
Tanner Flowage	A soft water drained impoundment with a low transparency, and medium brown color.	6.5 feet	There is unimproved access.
Teal Flowage	A very soft water, light brown colored drainage impoundment located on Dickey Creek. The water is alkaline and has a low transparency. One of the few impoundments that has provided satisfactory fishing and has not had a history of winterkill conditions. The flowage was deepened in 2006 and improvements to the fishery habitat were made. A handicapped pier and boat launch were constructed and the parking lot was improved.	10 feet	There is public access, handicap access, and a picnic site.
Townline Flowage	A soft water drainage impoundment located on two unnamed streams and Hay Creek. The water is alkaline, has a medium brown color, and a low transparency.	6.5 feet	There is public access from State Highway 54.
Weber Flowage	A very soft water drainage impoundment located on a ditch system. The water has a low transparency, is alkaline and has a light brown color.	3.5 feet	There is unimproved access.
Whitetail Flowage	A soft water drainage impoundment with light brown water and is alkaline. It is located on an unnamed stream.	8 feet	There is public access and an unimproved boat launch.
Wildcat Flowage	An artificial seepage lake. Water color is light brown and slightly acid. It has a low transparency.	3 feet	There is unimproved access and a picnic area.
Wilson Marsh Flowages	A soft water drained impoundment that has medium brown colored water, is acid, and has low transparency. It is located at the upper end of Dickey Creek.	8.5 feet	There is unimproved access.

low and the Dawsil soils having an available water holding capacity that is very high. The Iron Run soils are suited to trees, the Dawsil soils are generally unsuited to trees, and the Pony Creek soils are suited to conifers but are poorly suited for most other trees. Restrictive soil features for recreational development are ranked as "severe" for all soils within this association primarily due to humus, wetness and the sandy acidic nature of these soils. All soils in this association are unsuited to poorly suited for septic tank absorption fields and dwellings mainly because of wetness (Soil Survey of Jackson County, 2001).

Topography

The topography of the Black River State Forest is generally a flat to slightly rolling landscape. There are a few areas on the property, such as Castle Mound and Overmeyer Hills, which have more significant topographical relief.

WATER RESOURCES AND AQUATIC HABITATS

Lakes

There are very few natural lakes within the state forest, and these are mostly of the oxbow type-abandoned channels within the floodplains of the major rivers that contain water permanently or seasonally. Most standing water in the Black River State Forest is man-made impoundments and flowages constructed by the damming of small streams. Like the streams they impound, they are generally shallow, acidic, and infertile (WDNR, 1968). Table 3.1 is a summary of these impoundments.

Wetlands

The water table is generally close to the surface and small changes in surface topography may result in a wide range of soil moisture levels. The landscape is generally flat with sterile soils. The proximity to groundwater in large portions of the study area has resulted in large areas of wetlands or wetland complexes dominated by monotypic sedge/sphagnum vegetation. The peat in most wetlands is shallow underlain by sand.

Streams

The major drainages in the region include the Black River on the west and the East Fork of the Black River including streams in the Morrison Creek, Halls Creek and East Fork Black River watersheds. All the streams are characterized by stained water color caused by the organic (tannic) acids originating from the large wetland complexes within the watershed. Although historical stocking of trout was common, all of the streams within the boundary of the state forest are naturally populated with warm water forage and sport fish. Although the Black River can have fairly high nutrient levels, the smaller streams draining through the Black River State Forest are relatively low in nutrients and do not experience eutrophication problems. The tributaries to the Black River, East Fork of the Black River, and Robinson Creek are mostly high gradient streams. Other significant streams include Halls Creek, Hay Creek, Morrison Creek, Pigeon Creek and Perry Creek. The forest has a range of stream sizes from 1st order headwaters to the Black River which is a 6th order stream with an average flow of 290 cubic feet per second (cfs). Many of the small tributaries of the Black River have been dammed to create flowages used for cranberry production and wildlife habitat. The largest concentration of flowages occurs in the Dike 17 Wildlife Area, where the goal is waterfowl management. Surface water in the area originates in wetlands with significant peat deposits. There is very little groundwater input to most of the streams.

The Black River is a fast, large, warm, soft water stream. Approximately 12 miles are within the Black River State Forest. The species diversity is high and the river contains about 200 species of macroinvertebrates including one endangered, two

TABLE 3.2 FISH SPECIES IN THE EAST FORK OF THE BLACK RIVER

American Brook Lamprey	Common Shiner	Shorthead Redhorse
Banded Darter	Glass Pickerel	Smallmouth Bass
Black Crappie	Johnny Darter	Walleye
Blackside Darter	Largemouth Bass	White Sucker
Bluegill	Northern Hog Sucker	Yellow Bullhead
Central Mudminnow	Northern Pike	Yellow Perch
Common Carp	Rock Bass	

Source: Helsel, 2006

threatened, and 18 special concern species. Also present is the state threatened wood turtle, although the populations have decreased since 1994.

The East Fork of the Black River is a medium sized (5th order) warm, fast, brown-water stream with very soft water that approximately parallels the north edge of the study area. The East Fork Black River is nearly 60 miles long and flows through Clark, Wood, and Jackson counties. The river can sustain a sport fishery from its mouth to the village of City Point. During wet years, the sport fishery may extend upstream of City Point. The river flows largely through forested lands and receives flow from many tributaries which originate in wetlands. The East Fork of the Black River delivers very little sediment to Lake Arbutus as seen on aerial photos taken shortly after rain events. The bottom is mostly sand with rubble, bedrock, and silt also present. Approximately 3.3 miles of the East Fork of the Black River are within the forest. Water quality information from 1992, 1993 and 1997 indicate relatively low nutrients (total phosphorus = 0.058 mg/L, organic nitrogen = 0.86 mg/L) with slightly acidic conditions (pH = 6.69) with low buffering capability (alkalinity = 9.35 mg/L).

Macroinvertebrate index of biological integrity (IBI) rating from 1992 to 1996 generally reflect good stream conditions ranging between 4.00 (good) and 9.33 (excellent). Fisheries surveys in 2004 found 20 species (Table 3.2) as part of scheduled baseline sampling. The fisheries community is characteristic of a warm water sport fishery and provides plenty of angling opportunities.

The area of the river along the East Fork Campground has the best density of freshwater mussels in the stream and good diversity with eight species (three special concern). Also found in the stream are a series of open and partially wooded seeps which harbor two special concern beetle species.

Robinson Creek is a medium sized stream with light brown, cool water. Just over five miles of the stream are located in the forest. The stream originates as an unnamed flowage from about 12 headwater streams coming out of a portion of the Overmeyer Hills between Warrens and Millston. The portion named Robinson Creek originates in the Starlight Wetlands complex and the first few miles have cranberry flowages as tributaries. The creek has a high diversity of aquatic invertebrate species (60 taxa) plus 32 fish species. Several of the species are considered rare including two dragonflies, one damselfly, one stonefly, and one predaceous diving beetle. The macroinvertebrate index of biological integrity is rated fair based upon sampling in 2001. The stream is also the main drainage for the southern part of the forest. Robinson Creek Pines State Natural Area protects about one half mile of stream frontage. Baseline monitoring surveys in 2001 documented a fisheries community characteristic of a cold water stream including both brook and brown trout. Other species found in Robinson Creek include: American brook lamprey, blacknose dace, bluegill, brook stickleback, central mudminnow, creek chub, Johnny darter, largemouth bass, pearl dace, and white sucker.

Halls Creek is a small to moderate size (5th order) light brown stream that originates in the Western Coulee and Ridges Ecological Landscape and is a tributary to the Black River. Approximately 0.75 miles are in the forest. The stream contains ninety species of aquatic invertebrates and 28 fish species (none with special status). A baseline survey of Halls Creek in 1999 found seven different species dominated by American brook lamprey and brown trout. Other species include brook stickleback, brown trout, central mudminnow, Johnny darter, and white sucker. The macroinvertebrates collected in 1992 rate the biological integrity of the stream as good. No water quality information is available from Halls Creek. The eight species of mussels are high for a stream of its size.

Hay Creek is a small creek that originates in open wetlands in the Central Sands. Approximately 4.8 miles runs through the forest. Water quality information from 1992, 1993 and 1997 indicate relatively acidic conditions (pH = 6.11) with low buffering capacity (alkalinity = 3.78 mg/L) and is reflective of the large proportion of wetlands in the watershed. Hay Creek is relatively infertile with low nutrient levels (total phosphorus = 0.017 mg/L, organic nitrogen = 0.39 mg/L). The fishery is characteristic of an infertile, cold water system with a relatively small number of species found in 2004, including American brook lamprey, blacknose dace, blackside darter, brook trout, central mudminnow, creek chub, hornyhead chub and white sucker.

Some of the invertebrates found in the lower section are also indicative of cold water. The macroinvertebrate index of biological integrity for Hay Creek was generally good with ratings from 4.19 (fair) to 9.17 (excellent) over a period of time from 1992 to 2004. The lowermost portion of the creek is 2nd order in size and is somewhat entrenched with small seeps exposed along the banks. Ninety species of aquatic invertebrates and seven fish (none with special status) have been recorded but one species is considered globally rare.

Morrison Creek is a medium sized (5th order) brown-water stream. Approximately 15.8 miles are in the Black River State Forest. Morrison Creek begins in the far eastern portion of this watershed and flows west, through Potter's Flowage, the Black River State Forest and the Ho-Chunk Nation lands, before entering the Black River, 30 miles later. The lower eight

miles of Morrison Creek contain sport fish. A warmwater forage fishery inhabits the remaining 22 miles of the creek. There are several impoundments on the forest in the Dike 17 wildlife area. The last 24 miles of Morrison Creek are not impounded. Above Oxbow Ponds there is an uncommon softwater spring that emerges near the bank and flows a few feet into Morrison Creek. The stream has a high macroinvertebrate diversity (41 species) and composition for a stream of its size. The macroinvertebrate index of biological integrity for Morrison Creek collected in 1992 an 2004 were classified as fair and good respectively. Four macrovinertebrate species are special concern, and two are globally rare. In addition some 21 fish species (none with special status) are found in the creek. No mussel species were found, probably because the water temperature is too low on average. A wide range of aquatic habitats are found including oxbows, floodplain wetlands, seeps, and at least one softwater spring and spring run.

Pigeon Creek has very soft, medium brown colored water and flows in a generally westerly direction. Sand is the most common bottom type with silt and gravel present. The stream is classified as a type two brook trout stream.

Perry Creek originates in the Central Poor Fens and is approximately 2.8 miles long. The entire creek is in the forest. The water is cold and light brown. Sand and muck are predominant substrates in the upper section changing to shallow sand and gravel or sandstone bedrock downstream. There is a high diversity of aquatic invertebrates (39 species) for a cool water system plus at least six fish species (none with special status). Above the flowages the tributary streams are considered trout waters. Included in the tributary is a stretch of wet sandstone cliffs, which support a number of very rare aquatic insects. These rare taxa include two species of water scavenger beetles (one species is a hybrid previously known from only one site in Wisconsin) and a state record caddisfly. This caddisfly is the first record of this species in 57 years, and represents one of only three sites known anywhere.

Dickey Creek is a small, warm water stream that originates in open wetlands of the Black River State Forest within the Dike 17 Wildlife Area. The stream is stained by organic acids that are produced as shallow ground water percolates through the large amount of wetlands in the watershed. This stream flows in a northwesterly direction for approximately eight miles before discharging into Morrison Creek just above its

confluence with the Black River. Five dams are located on this stream from its headwaters downstream approximately 3.5 miles. The predominant bottom type is shifting sand with sparse gravel which limits the diversity of aquatic invertebrate species. The substrate and low gradient water flows also limit its potential as a warm water sport fishery. There are 19 acres of adjoining wetland to Dickey Creek and 12.8 miles of public frontage.

Only a small portion of Levis Creek is located in the Black River State Forest and originates in an extensive wetland on the property. Ditches constructed decades ago to drain the wetland persist. Squaw Mound Flowage is a 14 acre impoundment located on the upper end of Levis Creek. Further downstream, beyond the boundary of the Black River State Forest, the stream is managed as a class I trout stream from its junction with Indian Grave Creek to the Black River. Upstream of Indian Grave Creek, forage fish inhabit the stream. Macrovertebrates samples collected in 1991 and 2003 from the lower portion of Levis Creek indicate a good quality stream. Although deeply stained by organic (tannic) acids, water quality samples collected in 2003 indicate relatively low nutrient levels.

Valentine Creek flows through the Black River State Forest and the Ho-Chunk Nation lands. Valentine Creek is designated as a three mile long Class I trout stream, and is a tributary to Morrison Creek near its confluence with the Black River; however, recent fish surveys have found only limited number of trout and very poor to fair rated cold water fish index of biological integrity.

Use Limitations and Opportunities

The water in the streams is alkaline water with low transparency. Clear Creek, Indian (Valentine) Creek, Creek 18-10, and Beltz Creek are small creeks within the forest boundaries designated as Class I brook trout streams. The forest contains three seepage lakes and 16 seepage and stream impoundments. Because many of the flowages are subject to annual or frequent winterkills and are drawn down in summer to be regenerated for waterfowl food, they do not lend themselves to fish management. Battle Point, Whitetail, Townline, and Teal flowages provide limited fishery for largemouth bass, northern pike, and panfish species. The ponds at Oxbow, constructed in 1967, have been managed as "put and take" trout waters. The ponds are stocked annually with brook and rainbow trout.

The Black River State Forest also contains a number of dams. The dams were created in the 1930s by the Resettlement Administration. The dams created large shallow impoundments within the wetland areas of the forest. Over 90% of the impoundments created during the 1930s are still present on the forest today. The dams on the state forest are listed in Table 3.3.

TABLE 3.3 DAMS IN THE BLACK RIVER STATE FOREST

Official Name of Dam	Popular Name of Dam
Big Bear Flowage/Little Bear Flowage	
Black River Camp	
Koranda Flowage	
Lower Wilson Flowage/Upper Wilson Flowage	
No Name Flowage	
Resettlement Administration 1	Little Thunder Flowage
Resettlement Administration 2	Battlepoint Flowage
Resettlement Administration 3	Wilson Marsh Flowage
Resettlement Administration	Weber Flowage
Resettlement Administration 5	Mallard Flowage
Resettlement Administration 6	Tanner Flowage
Resettlement Administration 7	Sharptail Flowage
Resettlement Administration 8C	Townline Center
Resettlement Administration 8E	Townline East
Resettlement Administration 8W	Townline West
Resettlement Administration 12	East Seventeen Flowage
Lower Seventeen Flowage	
Resettlement Administration 13	Partridge Crop Flowage
Resettlement Administration 14	Black Duck Flowage
Resettlement Administration 15	Whitetail Flowage
Resettlement Administration 16	Wildcat Flowage
Resettlement Administration 17	West Seventeen Flowage
Resettlement Administration 19	Staffon School Flowage
Resettlement Administration 20	Squaw Mound Flowage
Resettlement Administration 21	Little Bear Flowage
Resettlement Administration 23	Pigeon Creek Flowage
Resettlement Administration 24	
Resettlement Administration 25	Funmaker Flowage
Resettlement Administration 26	
Resettlement Administration 27	
Resettlement Administration 28	
Resettlement Administration 29	Teal Flowage
Resettlement Administration 29C	
Resettlement Administration 29D	
Resettlement Administration 32	
Resettlement Administration 34	Dryland Flowage
Resettlement Administration 51	

Source: DNR 2006

UPLAND AND LOWLAND VEGETATION AND NATURAL COMMUNITIES OR HABITATS

A variety of tools are available to land managers engaged in forest planning and management. Using multiple sources of data, managers are better able to assess site capabilities, identify ecological and silvicultural alternatives, predict the effectiveness of possible silvicultural treatments, evaluate feasible management alternatives, and choose appropriate management objectives. These tools are an integral part of the master planning process and are used for sound forest management. A description of each source is provided below:

- The General Land Office's Public Land Survey data (GLO PLS) is utilized to assess historic vegetation. These surveys conducted between the 1830s and 1870s, divided the state into 6 by 6 mile townships and 1 by 1 mile sections so that the land could be homesteaded. In order to mark the corners of each section, the surveyors blazed up to 4 witness trees around the corner, and noted tree species, diameter, and distance and direction from the corner post. While the intent of these surveys was not ecological in nature, it does provide researchers with some ecological data about species composition and tree density at the time of the surveys.
- WISCLAND land use/land cover data is a source of generalized information on vegetation. These data were developed by the DNR with support from a consortium of other users. The data are an interpretation of the state's land cover from LANDSAT satellite images taken in 1992. This vegetation classification provides non-detailed information on several categories of forested and non-forested land.
- Wisconsin DNR forest reconnaissance provides data at the stand level such as current composition, but does not provide data on successional trends.
- Forest Inventory and Analysis (FIA) data are primarily used to assess the timber resource. The FIA uses statistical sampling at selected plots. These are the most accurate data for showing amounts (acreage and volume) of different forest types at the county level or a larger area. The data are not presented spatially, although information from sample points has occasionally been extrapolated to produce forest type maps.
- The Forest Habitat Type Classification System (FHTCS)[1]. The FHTCS identifies potential climax associations based on repeating patterns in the composition of the understory vegetation and different understory species. Individual forest cover types usually encompass a wide range of environmental conditions and do not accurately reflect site potential or respond predictably to given management techniques.
- Natural Heritage Inventory (NHI)[2] The NHI programs focus on rare plant and animal species, natural communities, and other natural features. The Wisconsin NHI Working List is the official list of endangered, threatened, and special concern plants and animals for Wisconsin. The Working List also includes a list of natural communities known to occur in Wisconsin. The list changes over time as the populations of species change, and as knowledge about species status and distribution increases.

Historic Vegetation

The Public Land Surveys (PLS) of the mid 1800s portray a landscape composed of extensive pine and oak forests on the uplands, and numerous tamarack swamps in the county. Concentrations of white pine or red pine dominated forests were noted south and east of Black River Falls, along the Black River and several tributaries (East Fork and Morrison Creek). The Overmeyer Hill-Wildcat Mound area contained black oak (Quercus velutina), white oak (Quercus alba), and red oak (Quercus rubra) forests. Mixed forests dominated by pines also contained some oaks. There was an abundance of forested lowlands dominated by tamarack and black spruce in the county.

The forest was heavily logged during Wisconsin's cutover period which started in the mid-1800s and lasted through the early 1900s. The logging activities peaked in the late 1800s with white pine and red pine the most heavily exploited species. Fires, due to logging activities, increased during the cutover. The cutover of the forests did not go unnoticed and led to a focus on forest conservation and the establishment of state and national forests.

Current Vegetation and Natural Communities

Today the area is much more heavily forested as a result of natural regeneration, tree planting, and fire suppression actions (Figure 3.1). The eco-region that includes the Black River State Forest has higher acreages of jack pine, red pine, and mixed conifer-hardwood forests than surrounding eco-regions. Several non-forested cover types are also well-represented in the forest, for example, wet meadows and lowland shrub cover types. Upland cover types include white pine, jack pine, oak with red pine, aspen (trembling and bigtooth), and paper birch is also common (WISCLAND data, WDNR 1999). Red maple is found but not dominant. The forest is mostly young and medium-aged. Stands exceeding 100 years of age are uncommon.

1 See A Guide to Forest Communities and Habitat Types of Northern Wisconsin (2002) by Kotar.

2 The most recent NHI information for Wisconsin is available at (www.dnr.state.wi.us/org/land/er/).

The Black River State Forest contains a variety of forest communities that differ in composition and structure depending on site-specific factors like soil type, soil moisture and nutrient levels, landform, disturbance regime, and historical events. Although oak and aspen are important timber types in the forest, pines dominate in this landscape. When the state forest was established in 1957, the jack pine timber type surpassed all pines representing more than 33% of the forest cover while white pine, the most indigenous species, consisted of only 6% of the acreage. Associated with upland sites from dry to dry-mesic, jack pine was also found extensively on a range of moist to wet forest conditions. The combination of a burned over landscape, the abandonment of farming, and fire suppression in the 1930s, favored the widespread establishment of jack pine.

Second growth white pine following the logging era of the 1880-90s was mostly relegated to moist sites (stream terraces) and wet areas (swamps) that allowed them to survive wildfires of the settlement period (1900-1930s). These remnant pockets have been the primary seed source for white pine to regain prominence. Today, white pine is 19% of the property's acreage and now surpasses jack pine acreage. Throughout the 50 years of the Black River State Forest's establishment, oak, aspen, and red pine acreage percentages have remained fairly constant.

Tree planting began before the property was officially designated a state forest. The first eight plantations were established in the fall of 1936 totaling 292 acres; all but one was a mix of jack, white, and red pine. The remaining plantation was entirely white pine. By 1940 the Farm Security Administration had planted 4,232 acres mostly on abandoned crop fields and some sparse, wooded pasture. From that beginning to 1957 a total of 5,674 acres were planted; the majority red pine, followed by jack pine, and white pine. The jack pine plantation acres have been harvested and are now mostly natural stands of mixed species.

Tree planting has continued on the state forest since its establishment in 1957. The first 25 years concentrated on restoring open lands such as crop fields and old pastures to forest cover, primarily red pine plantations. By the mid 1970s most of the open lands were planted and annual planting tapered off. In 1977, two large forest fires burned nearly 30,000 acres which included nine red pine plantations. Those red pine plantations were replanted by 1979.

In the early 1990s, a jack pine budworm outbreak occurred. Salvage harvests followed with approximately 4,000 acres being harvested. Of these acres 3,000 acres naturally regenerated resulting in mixed stands of jack pine, white pine, oak, and some red maple and aspen. Tree planting on the remaining 1,000 acres focused primarily on jack pine with attempts to establish red pine at some locations. These attempts resulted in the establishment of approximately 200 acres of red pine plantations. The Braacke scarifier or a commercial trencher was used on many areas for site preparation. Some herbicide application was used for site preparation or follow-up competition control after tree planting. Success of these plantings ranged from good to poor depending on soil moisture for each site.

Planting on the state forest continues today focusing on supplemental planting to augment natural regeneration. Annual planting varies from 100 to 350 acres with the average being 200 acres. Jack pine is the primary species planted. Previously,

FIGURE 3.1 CURRENT COVER TYPES IN THE BLACK RIVER STATE FOREST

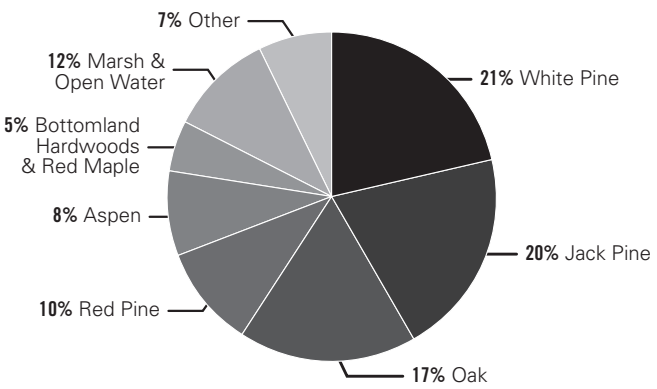


TABLE 3.4 BLACK RIVER STATE FOREST TIMBER SALE STATISTICS, 2003 - 2007

Calendar Year	Acres Harvested	Total Cord Equivalents Harvested	Total $ Value
2003	1,588	20,781	$795,490
2004	944	10,237	$408,487
2005	1,152	19,127	$595,499
2006	1,189	15,703	$579,763
2007	730	9,221	$394,812
5 Year Average	**1,121**	**15,014**	**$554,810**

hand and/or machine planting were the method of choice. However, the most recent trend has focused on direct seeding of jack pine which tentatively appears to be the most economically viable method of regeneration.

Timber harvesting on the Black River State Forest is implemented using sustainable forestry practices as outlined in the DNR Silviculture and Forest Aesthetics Handbook. On average over the past five years, approximately 15,000 cord equivalents were harvested annually, generating annual receipts of approximately $550,000 (Table 3.4). From 2003 to 2007, timber harvesting accounted for approximately 85% of the total average annual BRSF revenue. Timber products harvested from the Black River State Forest support primary and secondary wood using industries throughout the region, as well as stimulate the local economy.

The Black River State Forest, in conjunction with all state forests in Wisconsin, conforms to the rigorous principles and criteria for sound management requirements of forest certification through both Forest Stewardship Council (FSC) and Sustainable Forest Initiative (SFI) assessments. The Wisconsin Natural Resources Board approved forest certification programs at its April 28, 2004 meeting.

Currently, pine species dominate the Black River State Forest. This includes white, jack, and red pine. Oak and aspen are also important forest types present. Other species include those adapted to the lowland and swamp conditions on much of the forest, such as swamp/bottomland hardwoods, tamarack and black spruce. As the proposed master plan is implemented, aspen is predicted to stay relatively stable, jack pine is expected to decrease slightly, and a small decline in oak is predicted. Red maple and white pine are expected to increase considerably.

Dry Forests
Dry forests of oak, pine, or of mixed composition are extensive throughout the property. Most have been intensively managed, and some have been established as pine plantations on former farm fields. The greatest extent of relatively intact dry forest occurs on the sandstone ridges and mounds in the southeastern part of the forest in the Overmeyer Hills area, where black and/or northern pin oak are often co-dominant with white oak and all three native pines. Aspen, black cherry, and red maple are typical associates. White pine is an important dry forest understory species at many locations. Sites with jack pine and oak are typically managed via even aged management utilizing clearcut prescriptions. Some of these sites contain wild lupine and the associated Karner blue butterfly, both of which benefit from carefully planned clearcuts utilizing a shifting mosaic technique.

Dry-Mesic Forests
Dry mesic forests, composed of white and red pines and often mixed with oaks, are represented by significant occurrences on the slopes and higher terraces along the Black River and several tributaries (including the East Fork of the Black, and Hall's, Morrison, Dickey, Valentine, Perry, and Robinson Creeks). In hardwood stands, dominants include white and red oaks and a different association of understory plants than is characteristic of the drier forests or those heavily dominated by conifers. Some clearcuts have occurred in these areas however, many of these areas have received little forest management due to slopes or limited accessibility. Dry-mesic forests are sometimes associated with saddles and coves on dry sandstone ridge systems, especially where slope aspect is to the north or east or where soils are somewhat richer, deeper, and soil moisture is higher. These areas have received some even aged management via clearcuts primarily to release the white pine understory.

Mesic Forests
Mesic forests are rare within the state forest. The best developed stands of Southern Mesic Forest are on higher terraces along the Black River, where they occur within a mosaic of floodplain forest on the lower terraces and dry-mesic mixed forests of white pine, red pine, red oak, and white oak on the adjoining slopes. Harvest of elm occurred in some areas during the onset of Dutch Elm disease which resulted in regeneration of ash and maple in the gaps produced from this harvest, however, due to the limited extent and accessibility of this type, very little harvest has occurred.

Wet-Mesic Forests
Wet-mesic forests are best represented by mixed stands of white pine, red maple and jack pine. Springs are characteristic in this forest type which is subject to serious rutting, soil compaction, and is vulnerable to infestation by the exotic shrub, glossy buckthorn. Accessibility to these sites is very limited, however, some thinning has occurred when conditions allowed access in the white pine/red maple types and some even aged management via clearcuts has occurred in the jack pine/oak/red maple types.

Floodplain Forest
Floodplain forests are found within the state forest primarily along the Black River. This forest type includes silver maple, river birch, green ash, hackberry, and cottonwood. Harvest of elm occurred in some areas during the onset of Dutch Elm disease which resulted in regeneration of ash and maple in the gaps produced from this harvest.

TABLE 3.5 PLANTS WITH THEIR LARGEST STATE POPULATIONS IN THE REGION

Scientific Name	Common Name	Status in Wisconsin
Viola fimbriatula	Sand Violet	endangered
Asclepias ovalifolia	Dwarf Milkweed	threatened
Bartonia paniculata	Twining Screwstem	special concern
Bartonia virginica	Yellow Screwstem	special concern
Carex cumulata	Clustered Sedge	special concern
Carex folliculata	Long Sedge	special concern
Carex straminea	Straw Sedge	special concern
Juncus marginatus	Grassleaf Rush	special concern
Polygala cruciata	Crossleaf Milkwort	special concern
Potamogeton diversifolius	Water-thread Pondweed	special concern
Thelypteris simulata	Bog Fern	special concern

Source: NHI 2005

Conifer Swamps

Conifer swamps of tamarack and black spruce are uncommon and localized within the state forest. Some tamarack harvest occurred prior to and during the mid 1980s for utilization in the tobacco drying industry.

Rare Vascular Plants in the Region

The Wisconsin NHI database tracks 47 rare plant species in the Black River State Forest and surrounding Meadow Valley landscape. In the last 30 years three Wisconsin endangered plant species (reticulated nutrush (Scleria reticularis), sand violet (Viola fimbriatula), and beak grass (Diarrhena obovata) and five Wisconsin threatened plant species dwarf milkweed (Asclepias ovalifolia), bog bluegrass (Poa paludigena), pale green orchid (Plantanthera flava var. herbiola), prairie parsley (Polytaenia nuttallii) and algae-like pondweed (Potamogeton confervoides)) have been confirmed in the region. Table 3.5 lists plants that have their largest state populations in the Natural Heritage Inventory (2005) survey area, which includes the Black River State Forest.

Unique Habitats and Features

The Western Sands region identified in the Biotic Inventory (NHI, 2005), which includes the Black River State Forest, constitutes a large part of one of Wisconsin's most intact and distinctive landscapes. The characteristics described below are important considerations for state property master planning. They are not listed in order of importance.

- Large Areas of Natural Vegetation
- Extensive Public Lands
- Restoration Potential
- Landscape-scale Management
- Unique Ecological and Geological Attributes
- High Species Richness
- Natural Communities
- Exceptional Habitat Management Opportunities
- River Corridors

WILDLIFE RESOURCES

Wildlife in the forest is diverse and provides a habitat for many species that require large, contiguous tracts of land. The species composition depends on cover type and successional stage of the forest. Aspen and oak forests are important for white-tailed deer, Ruffed Grouse, snowshoe hare, Woodcock, black bear, beaver, as well as numerous species of small mammals and birds. Oak forests provides acorns as a food source and cover and browse for squirrels, deer, mice, raccoons, black bear, Bluejays, and Wild Turkeys.

Jack pine stands are used by many species that utilize early successional stages of forest growth. A high density of trees in young jack pine stands is beneficial to birds and mammals for nesting sites, cover and resting areas. Deer frequently browse young pines. Jack pine stands are also home to Kirtland's Warbler which is a recent rare occurrence on the forest.

Savannas and prairies are important to a number of ground-nesting species such as mallards, Woodcock, Sharp-tailed Grouse, cottontail rabbits, mice, songbirds, and reptiles. Wetlands, rivers, streams, and flowages provide habitat for aquatic and semi-aquatic species. Amphibians, shorebirds, reptiles, waterfowl, fish as well as some species of furbearing mammals require aquatic habitat. Many upland species use the wet areas of the forest for feeding and drinking. The large open areas in marshes are utilized by Sharp-tailed Grouse. Flowages and streams in the forest contain limited gamefish species such as muskellunge, northern pike, largemouth bass, smallmouth bass, walleye, panfish, bullheads, catfish, yellow perch, and brook, brown, and rainbow trout.

Several wildlife species, including Bald Eagles, wolves, bears, deer, Turkey, and Sandhill Cranes, have increasing populations

on the property while other species, such as waterfowl and Sharp-tailed Grouse, are declining in number. Some species, such as the whooping crane, were previously not known to be on the state forest, but are currently found here. Elk are currently not on the forest but areas provide suitable habitat and as a result are being considered for elk reintroduction.

In 1989 the Black River State Forest released wild turkeys. The first spring hunt was conducted in 1992, followed by a fall hunt in 1994. Since their introduction, the turkey population has increased dramatically. From 1995 to 2003 the number of turkeys harvested increased from 382 to 686 in the spring and from 130 to 227 in the fall.

Threatened, Endangered, Special Concern Species and Habitats

Rare Animals in the Region

The Wisconsin NHI database tracks 119 species of rare animals and two miscellaneous elements that the Biotic Inventory and Analysis of the Black River State Forest/Meadow Valley Landscape recorded in the area (2005). The rare animals include five mammals, 25 birds, 13 reptiles and amphibians, seven fish, 31 terrestrial invertebrates, and 38 aquatic invertebrates.

State Endangered or Threatened Animals

There are 27 animals listed as endangered or threatened in the region. Species that have experienced the greatest reduction in numbers over the last twenty years are the wood turtle and massasauga rattlesnake. Wood turtle population declines have been noted in the past 10 years in the Black River below Black River Falls. One cause may be illegal harvest (NHI 2005). The eastern massasauga rattlesnake population drastically declined in the 1980s and is now rare in the study area and throughout its entire range. Table 3.6 lists the 27 state endangered or threatened animals and their current status as documented in the Natural Heritage Inventory (2005) survey area, which includes the Black River State Forest.

Federal Endangered or Threatened Animals

Federally threatened and endangered species in the region are listed in Table 3.6. Kirtland's Warbler is one of the rarest birds in North America and although it has not been documented breeding on the Black River State Forest, there are records of singing males here and in the surrounding landscape. In addition, there are recent breeding records for Kirtland's Warbler in other portions of the Central Sands with habitats similar to some areas on the BRSF. The Kirtland's Warbler on the federal threatened and endangered resources list is noted as accidental. Bald eagles are proposed for delisting because of population recovery in Wisconsin. Karner blue butterflies have their largest global population in the study area and are managed under a formal Habitat Conservation Plan (WDNR 2000). The eastern massasauga rattlesnake is a candidate for federal listing and there are attempts to protect existing sites in order to prevent federal listing. The timber (gray) wolf is also relatively new to the study area. The region provides a unique niche in that it is the only suitable wolf habitat in central

TABLE 3.6 WISCONSIN ENDANGERED OR THREATENED ANIMALS FOUND IN THE BLACK RIVER REGION

Scientific Name	Common Name	State Status
Acris crepitans blanchardi	Blanchard's Cricket Frog	endangered
Cyclonaias tuberculata	Purple Wartyback	endangered
Cygnus buccinator	Trumpeter Swan	endangered
Lanius ludovicianus	Loggerhead Shrike	endangered
Nicrophorus americanus	American Burying Beetle	endangered
Ophisaurus attenuatus	Western Slender Glass Lizard	endangered
Podiceps grisegena	Red-necked Grebe	endangered
Schinia Indiana	Phlox Moth	endangered
Sistrurus catenatus catenatus	Eastern Massasauga Rattlesnake	endangered
Somatochlora incurvata	Warpaint Emerald	endangered
Thamnophis proximus	Western Ribbon Snake	endangered
Tyto alba	Barn Owl	endangered
Ammodramus henslowii	Henslow's Sparrow	threatened
Buteo lineatus	Red-shouldered Hawk	threatened
Callophrys irus	Frosted Elfin	threatened
Clemmys insculpta	Wood Turtle	threatened
Dendroica cerulea	Cerulean Warbler	threatened
Empidonax virescens	Acadian Flycatcher	threatened
Emydoidea blandingii	Blanding's Turtle	threatened
Lythrurus umbratilis	Redfin Shiner	threatened
Moxostoma Carinatum	River Redhorse	threatened
Nyctanassa violacea	Yellow-crowned Night-heron	threatened
Oporornis formosus	Kentucky Warbler	threatened
Pandion haliaetus	Osprey	threatened
Percina evides	Gilt Darter	threatened
Polyamia dilata	Net-veined Leafhopper	threatened
Tritogonia verrucosa	Buckhorn	threatened

Source: NHI 2005

Wisconsin and is separate from habitat in northern Wisconsin. The state forest falls into Wisconsin Wolf Management Zone 2 which is thought to be capable of sustaining 20-40 wolves. There were between 35-38 wolves reported in Management Zone 2 in 2002. The current population of wolves meets the recovery goals and the species has been delisted from a state threatened to a protected species (NHI 2005). The current list of federal threatened and endangered animals found in or near the state forest according to the Natural Heritage Inventory survey area is shown in Table 3.7.

Wildlife Species of Greatest Conservation Need

The Central Sand Plains Ecological Landscape and associated natural communities provide regionally significant habitats for many important native species with low or declining populations. These species are also known as Species of Greatest Conservation Need. These are wildlife species identified in Wisconsin's Wildlife Action Plan (WDNR 2005) that are most at risk of no longer being a viable part of Wisconsin's fauna and are in need of management to prevent them from being endangered or threatened at the federal level. While some of these species are currently state listed, many of them are not and some are game species. Appendix C lists priority Vertebrate Species of Greatest Conservation Need (SGCN) and their natural community associations that could benefit from management within the Central Sand Plains Ecological Landscape. That is, those high priority situations where all of the following are true: a) there is a high or moderate probability that the SGCN occurs in manageable numbers in the ecological landscape, b) the SGCN is significantly or moderately associated with the natural community, and c) the ecological landscape represents a major opportunity to manage or sustain that natural community. Wisconsin's Wildlife Action Plan provides the details on management for species and its habitats.

TABLE 3.7 FEDERAL ENDANGERED OR THREATENED ANIMALS IN THE BLACK RIVER REGION

Scientific Name	Common Name	Federal Status in Wisconsin
Dendroica kirtlandii	Kirtland's Warbler	Listed endangered, accidental
Haliaeetus leucocephalus	Bald Eagle	Listed threatened, under review for delisting
Lycaeides melissa samuelis	Karner Blue Butterfly	Listed endangered
Nicrophorus americanus	American Burying Beetle	Listed endangered, extirpated
Sistrurus catenatus catenatus	Eastern Massasauga Rattlesnake	Candidate for future listing

Source: NHI, 2005

RECREATIONAL FACILITIES AND USE

Existing Facilities and Services

The Black River State Forest provides a wide range of recreational opportunities. People come to enjoy camping, hiking, snowmobiling, fishing, bird watching, cross-country skiing, hunting and other activities. While snowmobiling has decreased due to a lack of snow, ATV riding has greatly increased.

The Black River State Forest has extensive trails for hiking, skiing, biking, nature walks, snowmobiling, and ATV/motorcycle riding. There are 35 miles of hiking, skiing and biking trails. The majority of these multi-use trails are located about five miles northeast of Millston on County Highway O, then north about one mile on Smrekar Road. Along the Red Oak and Central trails there are two rest areas with an Adirondack shelter, small fire ring, and picnic table. There are nine loops and all the trails are designed and marked for one-way skiing and bike travel with the exception of the link trails. The link trails are designed for two-way travel. The ski trails are groomed for both diagonal and skate style skiing. The trails are typically groomed after heavy weekend use and new snowfalls. A rustic ski shelter was recently constructed by the Black River Trail Foundation at the Smrekar parking lot. There are three nature trails totaling four miles in the forest at Castle Mound, East Fork and Pigeon Creek. Castle Mound and Pigeon Creek also contain bike trails.

Currently, there are nearly 48 miles of snowmobile trails in the state forest; approximately 33 miles of this total are also designated for ATV/motorcycle use. The state forest trails connect to the adjacent county forest trails so users have the ability to travel north/south between Millston and Lake Arbutus and east/west between Black River Falls and Pray. The large, linked trail system, along with easy access to the interstate, has generated a significant increase in ATV use on the property in recent years. The high use of the trails by ATVs during non-frozen conditions impacts the sustainability of the trails, increases maintenance needs, adds safety concerns, conflicts with other types of recreation and potentially creates environmental damage. In addition, many of the ATV trails were not originally designed for ATV use, which is one of the main underlying causes of environmental degradation.

The property has three family campgrounds, one group camp, one equestrian campground, as well as picnic and day use facilities. The family campgrounds are Castle Mound, Pigeon Creek, and East Fork. Castle Mound Campground located on Highway 12, one mile east of Black River Falls, has 35 sites, six with electricity. Castle Mound also has showers, flush toilets, ADA accessible facilities, and a sanitary dump station. The

campground is open year-round and campsites can be reserved between May 15th and October 1st and are first come, first serve the rest of the year. The campground also features a self-guided nature trail. Pigeon Creek Campground is located on North Settlement Road two miles northeast of Millston and is ADA accessible. The campground has 38 campsites, none with electricity; five sites are available year-round on a first come first serve basis. There is a five mile mountain bike trail at the campground that connects to 20 miles of hiking/skiing/biking trails. The Pigeon Creek Flowage has a beach for swimming and fishing. The East Fork Campground is located on the north end of the state forest on Campground Road. There are 24 sites, none with electricity; half of the sites are located along the bank of the East Fork of the Black River. Camping for all sites is available on a first come first serve basis. A small boat/canoe landing is located at the campground entrance. There is a nature trail along the bank of the East Fork of the Black River. Backpack camping, by permit, is also available on the property. The Black River State Forest Superintendent has the authority to modify the length of time campgrounds are open based on budget and staffing levels.

The Group Camp, located on the north end of the forest on Campground Road can accommodate up to 50 people. Water, pit toilets, picnic tables, cooking grills, a dog kennel, and a large fire ring are provided. The indoor building at the Group Camp is popular year-round. Twelve people can sleep comfortably. There are wood bunks in the cabin as well as a stove, refrigerator, gas fireplace, heated floors, and a bathroom with shower. The indoor facility is ADA compliant. Reservations are required and a two-day minimum stay is required on summer weekends. The Group Camp is a popular facility and frequently occupied.

The Equestrian Campground is located on the north end of the forest on Campground Road. Twelve sites are available on a first come first serve basis and include a picnic table, fire ring and tethering post. None of the sites have electricity but the campground has a vault toilet and a solar powered pump for water. The 20 mile horse trail begins at the campground.

South of Black River Falls, two campsites off of Hawk Island Road are available for canoeists. Camping is limited to a one night stay. Each site has a picnic table and fire ring. A unisex portable restroom is available.

Picnic facilities are located at the three campgrounds. All have hand pumps for water, picnic tables, grills and pit toilets. Castle Mound and Pigeon Creek have playground equipment and are ADA accessible. Perry Creek Park, Oxbow Pond, and Robinson Beach provide limited picnic facilities such as picnic tables and grills. There is also a log cabin picnic shelter at Castle Mound available by reservation. The shelter has a stone fireplace, electricity, tables, and outside cooking grills. The swimming area at Robinson Beach is anticipated to close due to lack of visitors. As a result, swimming will be more focused toward the facilities available at Pigeon Creek.

The forest also provides opportunities for other types of recreation. Hunting and trapping occur across the property for whitetail deer, turkey, grouse, bear, and small game such as rabbits, beaver, otter, muskrat, waterfowl and upland game. Archery hunting is increasing on the forest. An increase in illegal baiting for wildlife, especially deer has recently been noted. Fishing is also available on the flowages and on the Black River for panfish, northern pike, walleye, musky, sucker and bullhead. The forest contains 20 lakes totaling 572 acres, all are flowages except Lee Lake a 37-acre lake near Millston, Oxbow Pond, and a six acre unnamed lake located in the north end of the forest. Ten of the lakes are accessible only by a trail, three have a public boat launching facility, six do not have a defined access point, and one has a barrier-free boat ramp (WDNR, 2003). An accessible fishing pier is available at Teal Flowage.

Because the contact stations at the family campgrounds, ski trail parking lots and Robinson Beach are irregularly staffed, determining accurate visitor attendance numbers is difficult. Most state forest visitors are "day use" only users. The highest numbers of day use visitors occur in June, July, and August. The highest campground use occurs in July and the lowest is from December to March. Table 3.8 shows campground use in the state forest for 2005. The table lists the number of campers per night at the state forest.

June, July and August are the busiest months at the three family campgrounds, with weekends receiving the highest level of usage. Castle Mound is usually at or near capacity on the weekends during this time, while East Fork and Pigeon Creek are rarely occupied to full capacity. The percent occupancy for the summer months is shown in Table 3.9.

Special Recreational Settings

Dike 17 Wildlife Area, a 3,700 acre parcel, is primarily managed for waterfowl and Sharp-tailed Grouse. Each fall ducks and geese are attracted to the area which in turn attracts hunters and sightseers. The twenty flowages of the Dike 17 area were constructed by the CCC and Works Progress Administration (WPA) crews in the 1930s. The area has an observation tower for bird and animal observations. Approximately 2,100 acres of the area is a wildlife refuge and is home to several endangered and threatened species such as Bald Eagle, Osprey, Cooper's Hawk, Blanding's turtle, and the Karner blue butterfly.

SOCIAL AND CULTURAL RESOURCES

Land Ownership

Most of the land near and adjacent to the Black River State Forest is owned by the county and enrolled in Wisconsin's County Forest Program. Other land adjacent to the forest includes private ownership some of which is under cranberry production or enrolled in the managed forest law program and land owned by the Ho-Chunk Nation.

Historical/Archeological Resources

The State of Wisconsin Historical Society identified thirteen prehistoric archeological and historical sites on the forest plus an historic farmstead and cemetery, and Native American pow-wow grounds. The farmstead, located in the Overmeyer Hills, contains a root cellar, hand-dug well and an historic church cemetery. The site has been restored and is maintained by the forest. The historical sites on the property include five prehistoric campsites, four cemeteries, one group of burial mounds, a stone pipe findspot, a copper artifact findspot, and a "sacred spring."

Administrative and Other Facilities

The Black River State Forest has numerous administrative and operations buildings including: six storage buildings, three Park Entrance and Visitor Stations (PEVS), three small entrance stations at day use areas, two recreation shelters, three wood bins, one indoor group camp and two observation towers. The PEVS are located at East Fork, Castle Mound and Pigeon Creek Campgrounds, and the small entrance stations are located at Robinson Beach, the Smrekar trail, and the Wildcat trail. The recreation shelters are located at Castle Mound and the Smrekar trail. Four of the six storage buildings are located at Castle Mound ranging in size from 80 square feet to 2400 square feet. The East Fork, Pigeon Creek, and Castle Mound campgrounds each contain a wood bin that is 150 square feet. The indoor Group Camp is a 936 square feet wood building with electric heat and a gas fireplace. The building is equipped with water, fire extinguishers, electricity, and a bathroom plus an outdoor four unit vault toilet and dog kennel. The DNR owns 15.5 miles of road within the forest and the municipalities own 134 miles of road. Parking lots in the forest total approximately 500 stalls. One observation tower is located at Castle Mound and was built in 1966 to replace a fire lookout cabin on top of the mound; the other observation tower is located at the Dike 17 Wildlife Area.

TABLE 3.8 BLACK RIVER STATE FOREST APPROXIMATE CAMPGROUND VISITORS IN 2005 AND FIVE YEAR AVERAGES

Campground	Jan-Feb	Mar-Apr	May-June	July-Aug	Sep-Oct	Nov-Dec	Total 2005	5-year Average
Castle Mound	44	244	2,212	3,592	1,668	296	8,056	7,074
East Fork	4	152	1,188	1,580	1,244	268	4,436	4,354
Pigeon Creek	40	324	1,644	3,248	1,780	572	7,608	7,679
Group Camp	167	188	362	577	351	236	1,881	1,786
Canoe Camp	0	10	20	50	25	0	105	134
Equestrian Camp	0	52	192	104	212	4	564	465
Other (Backpack, Hunter)	2	85	199	118	168	658	1,230	1,524
Total	257	1,055	5,817	9,269	5,448	2,034	23,880	27,141

Note: For the group and canoe camp, the campers list the number in their party, and for the campgrounds, the average party is four people so the numbers of paid nights are multiplied by four.

TABLE 3.9 PERCENT OCCUPANCY OF FAMILY CAMPGROUNDS IN THE BLACK RIVER STATE FOREST (JUNE-AUGUST)

Campground	June 2005	July 2005	August 2005	3-Month Average	5-Year Average
Castle Mound	48%	68%	53%	56%	54%
East Fork	21%	21%	28%	23%	29%
Pigeon Creek	19%	42%	27%	29%	32%

REGIONAL CONTEXT

LAND OWNERSHIP AND LAND-USE PATTERNS

The Black River State Forest is located in Jackson County. Housing and population density in the region are low compared to other parts of the state. Between 2000 and 2005 the population in Jackson County increased by 3.4% (US Census 2000). In 2005, the county population was 19,828 with Black River Falls, the largest community in the county, having a population of 3,601 (State of Wisconsin 2005). The overall road density in the region is much lower than in most parts of the state even though Interstate 90/94 runs through the region and links the state forest and surrounding area with large metropolitan communities such as Minneapolis/St. Paul, Madison, Milwaukee, and Chicago. Other access routes for the forest include State Highways 12 and 54 and County Roads O and K.

The Biotic Inventory and Analysis of the Black River State Forest and Meadow Valley Landscape Study Area encompasses 710,180 acres in portions of Clark, Jackson, Juneau, Monroe, and Wood Counties (NHI 2005). There is a blend of land ownership types in this area with almost half of the study area (342,000 acres) being publicly owned. The largest tract of public land is the Clark County Forest at 132,852 acres. The Black River State Forest is Wisconsin's third largest state property. There are 10 State Natural Areas in the region; four are located within the state forest. The large tracts of private land in the region are primarily committed to cranberry production; 55% of the state's cranberry beds occur in this region. The Ho-Chunk Nation and individual tribal members also own property in the region.

Land cover is primarily forested and non-forested wetland. Commercial forestry is a major activity with fragmentation being less pronounced here than in the southern part of the state. Historic wetland alteration, primarily for agricultural use was unsuccessful except for cranberry production. Agricultural land use in the region is low.

The forest is close to Fort McCoy Military Training Center which is situated on approximately 60,000 acres and provides support and training facilities for over 100,000 military personnel annually. Fort McCoy recently renegotiated an expired land use agreement for military training purposes with the Black River State Forest.

BIOLOGICAL RESOURCES AND ECOLOGICAL NEED

Natural Resources

The U.S. Department of Agriculture Forest Service Forest Inventory and Analysis[3] (FIA 2006) for Clark, Eau Claire, Jackson, Juneau, Monroe, Trempealeau, and Wood counties indicate the total forest cover in the region remains the same today as it did in 1983 while the age of the forests is increasing (Miles 2006). The total forest cover and age of the forests for the seven county region is shown in Table 3.10 below.

Wisconsin's Natural Heritage Inventory (NHI) Program[4] indicates the presence of many unique, rare, and underrepresented species in the study area. As of 2006 the NHI documented 47 rare plants and 119 rare animal species within the study area. Forty-seven of the rare animal species have at least 25% of their statewide occurrences in the study area, the most well-known being the Karner blue butterfly. Other rare animal species found in the study area include the bald eagle, osprey, bobcat, goshawk, and timber (gray) wolf. The area also contains many natural communities. The NHI documented 196

3 FIA is an annual census of the nation's forests. It reports on status and trends in forest area and location; in the species, size, and health of trees; in total tree growth, mortality, and removals by harvest; in wood production and utilization rates by various products; and in forest land ownership.

4 The Wisconsin Natural Heritage Inventory (NHI) program is part of an international network of NHI programs. It is managed in Wisconsin by a section of the Wisconsin Department of Natural Resources' Bureau of Endangered Resources.

TABLE 3.10 PERCENT FOREST COVER AND TOTAL ACRES BY STAND AGE IN THE REGION FROM 1983-2004

		Stand Age				
Year	% Forested	0-20 years	21-40 years	41-60 years	61-80 years	81+ years
1983	44	470,200	280,800	502,400	230,100	209,100
1996	46	267,110	458,110	568,685	327,295	156,204
2004	45	264,757	383,257	608,947	375,568	122,907

Source: Miles, 2006

occurrences of 26 natural community types in the study area. Peatlands are more extensive in the region than anywhere else in southern Wisconsin. Similarly, the study area contains a greater acreage of contiguous forest than any other landscape of comparable size in the Eastern Broadleaf Forest Province. In addition to rare or unique species, the region contains several problematic invasive species such as common or glossy buckthorn, spotted knapweed, and leafy spurge.

Eco-regions

The National Hierarchical Framework of Ecological Units (NHFEU) defines eco-regions as geographic areas of similar physical, chemical, and biological characteristics in a hierarchical framework (Avers et al, 1994). The Black River State Forest is located within Province 222, Eastern Broadleaf Forest. The region is also within Section 222R, the Central Wisconsin Sands. The region is further divided into two subsections, the Central Wisconsin Sand Plain (222Ra) and the Neillsville Sandstone Plateau (222Rb). This eco-region is associated with a shallow irregular till surface with soils of loam, peat, and outwash sand. Wetlands, oak forests and pine-oak barrens are common and interspersed with smaller concentrations of more mesic hardwood forest and scattered hemlock relics. Current major land uses include forest management and agriculture (mostly in cranberry production).

RECREATIONAL RESOURCES AND USE

The activities people participate in depend on the region of the state and specific opportunities available. The 2005 Wisconsin Statewide Comprehensive Outdoor Recreation Plan (SCORP) listed walking for pleasure as the most popular outdoor activity in Wisconsin with 86% of adults participating. Other popular activities with over half of Wisconsin residents participating are family gatherings (81%), driving for pleasure (62%), and picnicking (57%). Bicycling, boating, visiting a beach, swimming, snow/ice activities of any kind and freshwater fishing round out the remaining top recreational activities in the West Central/ Lake Winnebago Region, which includes the Black River State Forest.

Public outdoor recreation in the region is provided by federal, state, county, municipal, and private landowners with the type and amount of opportunities varying depending on the size, management objectives, and owner. Recreational trail use, canoeing, fishing, hunting, and camping are all available in the region.

Canoeing and kayaking are popular in the state and the region provides opportunities for short half-day trips to multi-day trips. Paddling difficulty ranges from flat water to Class IV rapids. Portions of the East Fork and Black River run through the forest offering paddlers a mixture of whitewater and flat water canoeing along with rustic campgrounds. Several local businesses support and encourage visitation to these rivers by providing shuttles, guides, and private campgrounds.

Since 1992 the number of people in Wisconsin who fish and hunt has remained steady. Jackson County has the most miles of Class I streams and the third highest mileage of Class II streams within the west central region of Wisconsin. Most of these streams are located in the western portion of the county and not in the state forest. The Black River State Forest contains 20 lakes, about 15% of the total number found in the county. The lakes in the state forest total 572 acres which is approximately 11% of the total acreage for the county. One issue in the region is access to streams and lakes. Access to streams in the county is often via easement or at public road crossings.

The 2005 SCORP noted that as Wisconsin's countryside becomes increasingly divided, recreation planners should anticipate increased pressure for large, open public spaces where hunting is allowed (WDNR, 2006). The Black River State Forest and the Jackson County Forest are two of the largest contiguous tracts of open hunting land in the southern part of the state. The trends show that the number of deer and turkeys harvested in the county is higher than the number of county residents who identify themselves as hunters or purchase licenses in the county. This suggests that the area is a destination for hunters. Private land open to hunting contributes to the overall acreage available in the area. Most private land that is open to hunting is suitable for big game such as black bear and white-tailed deer, and upland hunting for turkey, grouse, rabbit, squirrel, etc. There is some private land available and suitable for waterfowl hunting (ducks and geese). Table 3.11 summarizes the hunting land available in Jackson County.

There are over 100 campsites available on the Black River State Forest, 285 on the Jackson County Forest and over 700 available throughout the county. Private campgrounds account

TABLE 3.11 ACRES AVAILABLE FOR HUNTING IN JACKSON COUNTY

Land Ownership	Big Game	Waterfowl	Upland Game
County	117,204	117,204	117,204
Federal	1,682	1,682	1,682
Private	15,670	651	15,670
State	73,659	21,003	73,362
Total	208,215	23,336	207,918

Source: WDNR, 2003

for almost half the camping opportunities in the county. The public and private campgrounds serve different niches. Private campgrounds provide most of the developed camping opportunities and camping opportunities combined with guide services. The public campgrounds provide most of the rustic and backcountry opportunities. If you include the surrounding counties of Adams, Chippewa, Clark, Eau Claire, Juneau, Marathon, Monroe, Portage and Wood, then the number of campsites in the region increases to 2,352 electrical sites and 2,097 non-electrical sites.

There are a variety of trails in the region available for ATV riding, biking, cross-country skiing, hiking, horseback riding, snowmobiling, and snowshoeing. The fastest growing sports in the region are ATV riding and off-road mountain biking. There are over 100 miles of ATV trails running through the state forest and county forest in Jackson County and over 300 miles of snowmobile trails. The neighboring counties of Chippewa, Eau Claire, Clark, Wood, Portage, Juneau, Adams, Monroe, and Marathon provide an additional 227 miles of summer ATV trails, 944 miles of winter ATV trails, and 2,852 miles of snowmobile trails. Snowmobile trails make up the highest percentage of trails in the region, followed by ATV trails, bike trails, hiking, and cross-country ski trails. Poor winter snow conditions in recent years have significantly reduced the number of snowmobile users in the area.

The popularity of more passive forms of recreation such as bird watching and wildlife viewing, nature study, and nature photography are expected to increase in the future due to an aging population and the desire for people to participate in activities deemed more environmentally friendly according to the Wisconsin Northern State Forest Assessment of Recreational Supply and Demand. (WDNR, 2001). State lands account for nearly 90% of the acreage in the region available for wild resource recreation and many areas of the BRSF offer passive recreation attributes. These users, who are an important source of revenue for local communities, prefer lands that are "wild" meaning a small number of support facilities and a feeling of solitude. They like areas where motorized sports are not allowed and where few signs of management activities exist. These preferences may cause conflict with the increasing presence of ATV use in the area (WDNR, 2001).

CULTURAL RESOURCES

The Black River State Forest has been used for recreation and commercial timber harvest for many years and as a result has contributed greatly to the local and regional economies. In addition to this, the land and water are important to local users, both for recreation and as income derived from recreational use by non-local users. The DNR is committed to involving the public in the planning process and keeping them appraised of any changes in either use or forest management.

SOCIO-ECONOMIC TRENDS

Population Trends

Human population density is one of the most notable differences between the county and state. In 2000, Jackson County had only 19.3 people per square mile while the rest of the state averaged 98.8 people per square mile. (MRRPC, 2005). The low population density may contribute to more urban dwellers visiting the area for forest-based recreation. The easy access to the forest via Interstate Highway 90/94 positions the county in a prime location for visitors from Chicago, Milwaukee, Madison, Minneapolis, and other metropolitan areas.

Employment Trends

In 2003, the largest employment sectors in the Jackson County were government and government enterprises (29.0%), farm employment (10.2%), retail trade (9.0%), construction (8.8%), transportation and warehousing, and manufacturing (7.3%). Sectors comprising the largest percentage of total earnings were government and government enterprises (32.7%), construction (14.1%), transportation and warehousing (12.8%), manufacturing (9.4%), and farm earnings (6.4%). (MRRPC, 2005). In 1999 the median household income for Jackson County was $37,015 compared to $43,791 for the state. The top 10 employers in Jackson County in 2004 are shown in Table 3.12.

Economic Trends

Tourism-related travel expenditures in the region were $587 million in 2004. This was about 5% of the $11.8 billion in state travel revenues. The travel revenues in the region generated over 15,000 jobs and employed 9% of the labor force. Most travel dollars were spent on lodging, recreation, food, and shopping. Table 3.13 provides information on visitor tourism expenditures, employment impacts, and resident income impacts for the region and state. Jackson County ranks third highest for visitor expenditures and employment impact in the nine county area. (MRRPC, 2005)

Wood-based industries are an important part of the state and regional economies. Wisconsin is the number one paper making state in the nation. Approximately 18% of the jobs in Wisconsin are tied to either wood-based industries or tourism sensitive sectors. In Wisconsin over 1,800 companies in the timber industry employ over 99,000 people with a total payroll of $3.6 billion (WDNR, 2000). The value of annual timber removals in Wisconsin was almost $210 million and almost 82% of that was from private lands. Public forest lands in Wisconsin account for the remaining harvest value. On public lands, 50% of the harvest value came from federal property,

36% from county forests, and 14% on state lands. A 2000 report indicated the highest stumpage values were in the central and southwestern parts of the state. Central Wisconsin, which includes the Black River State Forest, valued annual timber removals at $62.8 million dollars (WDNR 2000).

Recreation in the forest also impacts the local economy. In a span of 10 years Jackson County saw an increase of over 200 percent in traveler spending from $22 million in 1994 to $72 million in 2005 according to Jackson County's 2005 Economic Impact, provided by the Wisconsin Department of Tourism. Eighteen percent of all expenditures were made in the winter, 22% were made in the spring, 36% in the summer, and 23% in the fall (WDOT, 2006). Some local businesses in the vicinity of the state forest report that ATV customers now account for a significant portion of their sales and revenues (Wyenberg, 2006).

Non-motorized forms of recreation also have a positive economic impact on local economies. The Wisconsin Department of Tourism found that the average expenditure for western Wisconsin trails, including the Elroy-Sparta Trail, for trail visitors who were not local was $26.43 per person per day (WDOT, 2000).

PROPERTY CAPABILITIES, LIMITATIONS, AND OPPORTUNITIES

Statutory and Other Mandatory Requirements

Management of the Wisconsin State Forest System is guided by Wisconsin Statute 28.04 which ensures that state forests will provide a range of economic, ecological and social benefits for now and years to come. A sustainable forestry-based approach is used to enable these aspects of the forest environment to be maintained and enhanced for current and future generations.

- The master plan process is guided by the following state and federal regulations:
- The Black River State Forest Master Plan will be developed within the parameters of Administrative Code NR 44, which governs master planning for DNR properties and requirements of WEPA (Wisconsin Environmental Policy Act).
- The Black River State Forest will be managed and developed as a state forest as outlined in state statutes 28.04 Wis. Stats.
- The state forest will be managed and developed in accordance with Administrative Code NR 150 (Environmental Impact) and NR 1(Natural Resources Board Policies).
- Activities on DNR properties are governed by Administrative Code NR 45 (Use of Department Properties)
- All other state statutes, administrative codes, and DNR manual codes will apply.

TABLE 3.12 TOP 10 EMPLOYERS IN JACKSON COUNTY IN 2004

Establishment	Product or Service	Number of Employees
Ho Chunk Nation	Tribal government	1000+
Millis Transfer Inc	Gen. freight trucking	500-999
County of Jackson	Executive and legislative offices	250-499
Black River Falls Public School	Elementary and secondary schools	250-499
Lunda Construction Co	Highway, street, and bridge construction	250-499
Department of Corrections	Correctional institutions	250-499
Leeson Electric Corp	Motor and generator mfg.	100-249
Black River Memorial Hospital	Gen. medical and surgical hospital	100-249
Fleet Guard Inc	Misc. general purpose machinery mfg.	100-249
Flying J Inc	Gasoline stations with convenience stores	100-249

Source: MRRPC, 2005

TABLE 3.13 TOURISM IMPACT, VISITOR, EMPLOYMENT AND INCOME IMPACT IN 2004

Jurisdiction	Total Visitor Expenditure	Total Employment Impact
Buffalo	$19,621,827	519
Crawford	$49,866,224	1,316
Jackson	$76,260,278	1,674
LaCrosse	$212,464,287	5,829
Monroe	$108,354,273	2,859
Pepin	$8,135,868	213
Pierce	$32,393,430	855
Trempealeau	$38,247,980	1,010
Vernon	$41,591,257	1,097
Region	$586,935,424	15,372
State	$11,781,228,510	309,207

Source: MRRPC, 2005

Forest Certification
State forest management is now guided by recent dual forest certification under the Forest Stewardship Council (FSC) and the Sustainable Forest Initiative (SFI). To maintain this certification, the state of Wisconsin must manage state forests using strict environmental, social, and economic standards as outlined in the certification agreement.

ECOLOGICAL SIGNIFICANCE AND CAPABILITY OF THE BLACK RIVER STATE FOREST

This analysis provides baseline information and as new information becomes available, it will be incorporated into the planning process as part of a dynamic and responsive tool used both by planners and property managers. The property and regional analysis identifies trends, issues and opportunities related to the property in a regional context, providing the basis for future decisions. The property, the region, and the role the property plays in a regional context will help shape and guide the master plan.

Forest Management Capability
Forest management practices are the basis for creating a healthy forest and diverse wildlife habitat. Current forest management follows silviculture guidelines and considers the needs of numerous rare species. Timber harvests, conducted in accordance with acceptable silvicultural prescriptions, and within the annual allowable harvests, create age diversity critical for wildlife food and cover needs, generate a continual flow of forest products to the market, reduce the load of fuel for potential forest fires and stimulate the local economy by providing employment opportunities. Regeneration efforts, both natural and artificial, keep the state forest ownership in a productive status and ensure a variable range of species.

The forest has higher percentages of jack pine, red pine, and mixed conifer-hardwoods than other parts of the state. White pine acreage has been steadily increasing and will provide opportunities to enter sawtimber markets in the future. The forest also includes cover types such as oak, aspen, and paper birch which are primarily medium aged. Red maple is found but is not dominant.

More pressure will be placed on publicly owned lands to provide the needs and expectations from escalating global demand for wood products. An increase in recreational demands and a decrease in private forestlands available for timber production also will impact the state forest resources.

Ecological Capability
The large, continuous forested area, and the intermixed open areas and wet communities of the state forest and surrounding areas provide habitat and a niche for numerous wildlife species. This includes mammals that require large ranges (e.g. timber (gray) wolf, black bear), raptors that require open water or closed forest (e.g. Bald Eagle, Red-shouldered Hawk), birds that require expanses of savanna or prairie (e.g. Woodcock, Sharp-tailed Grouse) as well as many others. The current diversity of wildlife also has been influenced by the creation and maintenance of a dike and dam system created in the early 1930s. For the continued health of the wildlife community, the maintenance of healthy natural communities is essential. This is not only for the benefit of the rare wildlife species, but also for a wide variety of species including white-tailed deer, turkey, grouse, beaver, songbirds, herpetiles, invertebrates and fish. Efforts are also directed at increasing the diversity of native wildlife species represented. For example, opportunities may exist to manage for an elk herd on the property.

Plants, animals, and natural communities that are geographically limited and highly localized in Wisconsin are well represented within the Black River State Forest. Area sensitive species such as large predators, forest interior birds, and many grassland birds are present and can be maintained with appropriate resource management. The peatlands support many species that are rare or absent from similar habitats in northern Wisconsin. Older stands of white pine-red maple swamp support distinctive collections of plants and animals including many that are rare. There are opportunities to protect, maintain, manage, and restore pine-oak barrens, dry pine-oak forests, white pine-red maple swamp, central poor fen, muskeg, tamarack-black spruce swamp, central sands pine-oak forest, floodplain forest, southern mesic forest, northern dry-mesic forest, dry cliff, and moist cliff. These native plant communities were chosen because the state forest contains occurrences that are relatively large and show little evidence of disturbances such as hydrologic alteration. Many northern mammals, birds, invertebrates, and plants occur here at or near their southern range limits.

The soils in the Black River State Forest are generally acidic, infertile, and prone to drought; the sands of this area are among the most sterile soils in the state. Extensive areas of organic soils (peats and mucks) are associated with the area's abundant wetlands. Restrictive soil features for recreation development are ranked as "severe" (on a scale of slight, moderate, or severe) for all three major soil types on the forest due to the sandy and acidic nature of the soils.

Karner blue butterfly is an important species on the forest and forest, recreation and wildlife management activities are compatible with the existing Habitat Conservation Plan (HCP). The Karner blue butterfly is important because it has its largest global population in the region. Additional areas may be suit-

able for habitat manipulation to favor Karner blue butterfly and other endangered or species of concern.

Invasive species are becoming a concern across the state and the Black River State Forest is no exception. Primary invasives are glossy or common buckthorn, spotted knapweed, and leafy spurge. Management strategies are currently being developed to identify, prioritize and control invasive plants on the property to limit the loss of critical habitat and site quality.

The Black River corridor, its tributaries, and adjacent community types are vital components of the property both from a recreational point of view but also as an ecological resource for native species. The Black River corridor and its tributaries support significant occurrences of natural communities, support many rare species, and afford the opportunity to maintain connections with other southern Wisconsin landscapes. Unimpounded stretches of the headwater streams originating in the peatlands of this region provide habitat for a number of rare invertebrate species. Every consideration should be given to maintaining the unique and valuable resource.

RECREATIONAL SIGNIFICANCE AND CAPABILITY OF THE BLACK RIVER STATE FOREST

The state forest's relative proximity to major population centers, along with the interstate artery, makes public access to the property and surrounding areas convenient and easy and is considered a regional destination for outdoor recreation opportunities. Recreational amenities abound, and the flowages and rivers are already a large draw to recreational activities. Water based recreation activities such as boating, canoeing, fishing and swimming are popular on the property and public access to rivers and beaches provide a niche in the area. There are also four popular campgrounds in the forest which are available for year-round camping. The trail system on the forest provides some of the best opportunities in the region for hiking, biking, skiing, horseback riding, snowmobiling and ATV riding. Another niche of the Black River State Forest and surrounding county forest land is the opportunity for hunting which draws people from around the region. Dike 17 is a unique and popular locale for hunters, bird watchers, and hikers alike.

Growth of motorized recreation uses needs to be balanced with the increasing interest in passive forms of recreation. The frequency of user conflicts may increase on the state forest when incompatible recreation activities overlap. The rise in motorized recreation will place more pressure on the property's existing ATV trail system and will impact the sustainability of the landscape. Local economic needs, which are influenced by state forest recreation uses, must be equalized with the forest's ecological capabilities. Private enterprise also provides access to many recreational experiences in the area so that the state forest does not need to provide the entire gamut of facilities. Jackson County and the surrounding Clark and Eau Claire Counties have over 300 miles of trails on public and private land.

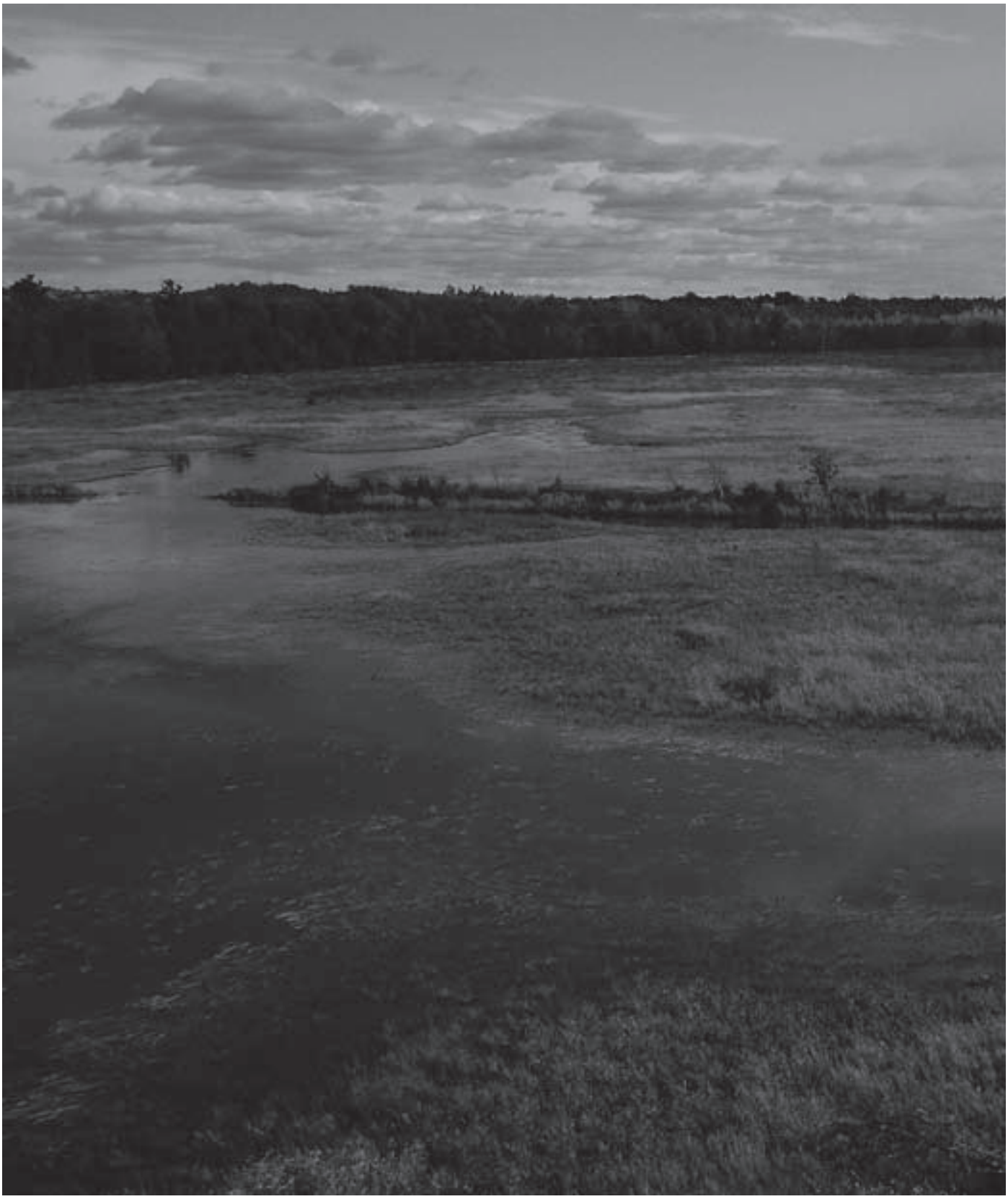
SUMMARY

The Black River State Forest plays a significant role in the central sands area of Wisconsin because it is part of a large concentration of public ownership, forested areas, and is less fragmented than the southern portion of the state which creates unique opportunities for landscape scale management. The property is exemplified by lack of roads and low human population densities that are similar to the wildest areas of northern Wisconsin. Rare species and natural communities also abound including some that are globally rare and some where the state forest offers the best opportunities for management in the entire state.

The Black River State Forest offers timber production, recreation, and landscape scale natural community restoration opportunities that are unmatched this far south in Wisconsin. The state forest is a property that is highly suitable for providing a range of forest products and recreation opportunities while enhancing natural communities and habitats. Opportunities exist to protect additional water and land resources, to enhance management efficiencies, to buffer against development, and enhance connectivity. Given all of these points, modification of the forest boundaries could enhance connectivity between public lands, reduce some of the challenges and limitations for management and recreation, and buffer against problems associated with the development adjacent to natural communities. Boundary adjustment opportunities exist to extend protection to key sites including the East Fork of the Black River and the Black River corridor.

As the largest block of state ownership in the area, the Black River State Forest has a special role to play in providing ecological, recreational, economic, and cultural benefits to the region. The property needs to balance natural community management, recreation needs, timber production, and social needs within the capabilities of the land.

REGIONAL CONTEXT



APPENDICES

APPENDIX A. BLACK RIVER STATE FOREST MASTER PLAN DESIGNATION PROCESS FOR STATE NATURAL AREAS

Generally, natural areas are tracts of land or water harboring natural features that have escaped most human disturbance and that represent the diversity of Wisconsin's native landscape. They contain outstanding examples of native biotic communities and are often the last refuges in the state for rare and endangered plant and animal species. State Natural Areas (SNAs) may also contain exceptional geological or archaeological features. The finest of the state's natural areas are formally designated as State Natural Areas.

The Wisconsin State Natural Areas Program oversees the establishment of SNAs and is advised by the Natural Areas Preservation Council. The stated goal of the program is to locate, establish, and preserve a system of SNAs that as nearly as possible represents the wealth and variety of Wisconsin's native landscape for education, research, and to secure the long-term protection of Wisconsin's biological diversity for future generations. SNAs are unique in state government's land protection efforts because they can serve as stand alone properties or they can be designated on other properties, such as a state forest. By designating SNAs within the boundary of the Black River State Forest, two different, legislatively mandated Department goals are being accomplished. This arrangement makes abundant fiscal sense because the state does not have to seek out willing sellers of private lands to meet the goals of multiple Department programs. This avoids duplicating appraisal and negotiation work and provides dual use of land that is already in public ownership.

The process to establish a SNA begins with the evaluation of a site identified through field inventories conducted by DNR ecologists, including the Biotic Inventory and Regional Analysis. Assessments take into account a site's overall quality and diversity, extent of past disturbance, long-term viability, context within the greater landscape, and rarity of features on local and global scales. Sites are considered for potential SNA designation in one or more of the following categories:

- Outstanding natural community
- Critical habitat for rare species
- Ecological reference (benchmark) area
- Significant geological or archaeological feature
- Exceptional site for natural area research and education

Designation Process of SNAs

Step 1: Assessments
Biotic Inventory and
SNA GAP analysis

Step 2: Preferred Alternative
The highest rated biotic sites and those with potential for filling gaps.

Step 3: Proposed Master Plan
Native community sites
Forest Production Area

Step 1: Results from both the SNA GAP analysis and the Biotic Inventory, which were conducted on the BRSF within the last few years, were used to decide which areas would be SNA opportunity areas.

STATE NATURAL AREA PROCESS

The data gathered via the Biotic Inventory identifies and evaluates the natural communities, significant plant and animal populations, and selected aquatic features and their associated biotic communities. This report emphasized important protection, management, and restoration opportunities, focusing on both unique and representative natural features of the BRSF property and surrounding landscape.

The SNA GAP analysis looks at representation for each primary natural community in each Ecological Landscape and determines if an adequate number of ecological reference areas are in place to capture the variation across the landscape.

Step 2: Using both the Biotic Inventory and SNA GAP analysis, the BRSF Preferred Alternative took sites ranked high and proposed native community management areas.

Step 3: After public review of the preferred alternative, these opportunity areas were then designated Native Community Management Areas. After the management goals were developed, the team reassessed the boundaries to assure that each forest stand was in the correct management area. Experts worked together to ensure that these sites were also given consideration as potential State Natural Areas.

Once approved by the Natural Resources Board, sites are formally "designated" as SNAs and become part of the Wisconsin State Natural Areas system. Designation confers a significant level of recognition of these sites' natural values through state statutes, administrative rules, and guidelines.

Impact to Master Plan Process

The process for selecting and designating SNAs is determined by cooperative efforts between two programs within the DNR: The Division of Forestry and the Bureau of Endangered Resources. The master planning process for state forests requires that the goals set by the Division of Forestry be considered before the Bureau of Endangered Resources submits candidate sites for SNA designation. This is done so that all sites are evaluated for timber production, which is outlined as a Division of Forestry priority. As a result, SNAs are considered overlays to Land Management Areas. In this way, the same piece of land can achieve the goals of two different Department programs. Management activities for each proposed SNA reflect the general management prescriptions proposed for the area in which the SNA is located. For example, a SNA located within an area managed for white pine will follow the objectives for that land management area, rather than a separate SNA management plan. The exact same timber management would occur with or without SNA designation.

Land Management Impact by Native Community Management Areas and Designation of SNAs

Native community management areas emphasize aspects of the ecosystem that provide the full range of forest types and age classes as promoted by the property goals. Areas are designated to manage for old growth characteristics, large areas of un-fragmented forest, and to protect and enhance water resources.

SNA Management Activities

State Natural Areas are not exclusively passive management. Between 2003 and 2007, over 200 SNAs all over Wisconsin have had some type of active management. Examples of management activities include exotic species removal, burning and fuel reduction, brushing, trail development, ditch filling, and planting. Timber harvesting is not a primary focus of a SNA, but it is often necessary to achieve the desired ecological goals of a specific habitat. During the same five years, 29 commercial timber operations were conducted on SNAs to achieve the ecological goals of the site. Regardless of any designation, wildfires on state forests would be actively suppressed, safety measures would occur in developed areas, and insect and disease outbreaks would be considered for control.

Recreational Impacts

Impacts would be minimal because the recreation opportunities for any given area were determined before consideration as a SNA. State Natural Areas are not appropriate for intensive recreation and such areas were automatically ruled out as potential sites during the development of the preferred alternative. However, SNAs can accommodate low-impact activities such as hiking, bird watching, and nature study. Examples of existing facilities within proposed SNA sites include hiking and cross-country ski trails, and boat landings and ramps.

Benefits for a Partnership between State Forests and the State Natural Areas Program

The SNA program has standardized methods for conducting long-term monitoring of ecosystems and also has a network with a broad range of researchers, from aquatic biologists and botanists to zoologists that can be encouraged to conduct research on the state forest to enhance our understanding of the BRSF ecosystem. The experts in the Division of Forestry have experience in monitoring the trees and other plants, while SNA ecologists have expertise in monitoring terrestrial invertebrates, fungi and lichens, ground layer plants, mammals, reptiles and amphibians, and birds. Together an exceptional collaborative monitoring program could be developed.

- The SNA program can bring a broad range of educators together to assist in understanding and interpreting the ecology of the BRSF.
- The SNA program can lend its expertise to help create ecological interpretive signs and trail guides for better understanding of the full range of biological diversity on the BRSF.
- The SNA Program can assist in conducting land management activities such as invasive exotic species control, brushing and conducting prescribed burns.
- The Division of Forestry would not lose any of its management or decision-making authority, but gain the ability to provide a broader range of opportunities that would help fill its mission by collaborating with the SNA Program.
- An outside forest certification audit of the State Forest Program concluded that cooperation between the Division of Forestry and the State Natural Areas Program was commendable. This cooperation should continue to maintain such a high rating by future auditors.
- With a joint consideration, the same piece of land can achieve the goals of two different programs. If there were a lack of teamwork, the SNA Program would still pursue sites to fulfill its goals. Such a venture could duplicate an additional 4,278 acres of land with an approximate cost of $10.5 million or more to the state of Wisconsin. Cooperation makes abundant fiscal sense.

APPENDIX B. ENDANGERED OR THREATENED SPECIES AND SPECIES OF SPECIAL CONCERN

The table below lists animals on the Black River State Forest which are endangered, threatened or of special concern, based on the Natural Heritage Inventory (NHI) database. The listing includes both state and federal designations. The aim of a "Special Concern" designation is to focus attention on certain species before they become threatened or endangered. Species of Greatest Conservation Need (SGCN) are also indicated.

Scientific Name	Common Name	State Status	Federal Status	SGCN
Agabus bicolor	A Predaceous Diving Beetle	SC/N		x
Alasmidonta marginata	Elktoe	SC/H		
Ammodramus leconteii	Le Conte's Sparrow	SC/M		x
Anguilla rostrata	American Eel	SC/N		x
Apalone mutica	Midland Smooth Softshell Turtle	SC/H		x
Arphia conspersa	Speckled Rangeland Grasshopper	SC/N		x
Atrytonopsis hianna	Dusted Skipper	SC/N		
Banksiola dossuaria	A Giant Casemaker Caddisfly	SC/N		x
Botaurus lentiginosus	American Bittern	SC/M		x
Buteo lineatus	Red-shouldered Hawk	THR		x
Callophrys henrici	Henry's Elfin	SC/N		
Callophrys irus	Frosted Elfin	THR		x
Canis lupus	Gray Wolf (aka Timber Wolf)	SC/FL	LE	x
Chlosyne gorgone	Gorgone Checker Spot	SC/N		
Chromagrion conditum	Aurora Damselfly	SC/N		
Cicindela patruela huberi	A Tiger Beetle	SC/N		x
Clemmys insculpta	Wood Turtle	THR		x
Cyclonaias tuberculata	Purple Wartyback	END		x
Cymbiodyta acuminata	A Water Scavenger Beetle	SC/N		x
Dendroica cerulea	Cerulean Warbler	THR		x
Dendroica kirtlandii	Kirtland's Warbler	SC/FL	LE	x
Diadophis punctatus edwardsii	Northern Ringneck Snake	SC/H		
Dichromorpha viridis	Short-winged Grasshopper	SC/N		x
Empidonax virescens	Acadian Flycatcher	THR		x
Emydoidea blandingii	Blanding's Turtle	THR		x
Erynnis martialis	Mottled Dusky Wing	SC/N		x
Erynnis persius	Persius Dusky Wing	SC/N		x
Etheostoma clarum	Western Sand Darter	SC/N		x
Euphyes bimacula	Two-spotted Skipper	SC/N		

ENDANGERED OR THREATENED SPECIES AND SPECIES OF SPECIAL CONCERN

Scientific Name	Common Name	State Status	Federal Status	SGCN
Haliaeetus leucocephalus	Bald Eagle	SC/P		x
Hemidactylium scutatum	Four-toed Salamander	SC/H		x
Hesperia leonardus	Leonard's Skipper	SC/N		
Hydroporus badiellus	A Predaceous Diving Beetle	SC/N		
Ilybius discedens	A Predaceous Diving Beetle	SC/N		
Laccobius reflexipennis	A Predaceous Diving Beetle	SC/N		x
Limotettix pseudosphagneticus	A Leafhopper	SC/N		x
Lycaeides melissa samuelis	Karner Blue Butterfly	SC/FL	LE	x
Melanoplus fasciatus	Huckleberry Spur-throat Grasshopper	SC/N		x
Melanoplus stonei	Stone's Locust	SC/N		x
Moxostoma carinatum	River Redhorse	THR		x
Neurocordulia molesta	Smoky Shadowfly	SC/N		
Ochrotrichia riesi	A Purse Casmaker Caddisfly	SC/N		x
Ophiogomphus smithi	Sand Snaketail	SC/N		x
Oporornis formosus	Kentucky Warbler	THR		x
Orphulella pelidna	Spotted-winged Grasshopper	SC/N		x
Paradamoetas fontana	A Jumping Spider	SC/N		x
Percina evides	Gilt Darter	THR		x
Poanes massasoit	Mulberry Wing	SC/N		
Polyamia dilata	Prairie Leafhopper	THR		x
Protonotaria citrea	Prothonotary Warbler	SC/M		x
Psinidia fenestralis	Sand Locust	SC/N		x
Schinia indiana	Phlox Moth	END		x
Seiurus motacilla	Louisiana Waterthrush	SC/M		x
Sistrurus catenatus	Eastern Massasauga Rattlesnake	END	C	x
Somatochlora incurvata	Warpaint Emerald	END		x
Somatochlora tenebrosa	Clamp-tipped Emerald	SC/N		x
Sorex arcticus	Arctic Shrew	SC/N		
Sorex hoyi	Pygmy Shrew	SC/N		
Sorex palustris	Water Shrew	SC/N		x
Soyedina vallicularia	A Nemourid Broad-backed Stonefly	SC/N		x
Sympetrum danae	Black Meadowhawk	SC/N		
Trachyrhachys kiowa	Ash-brown Grasshopper	SC/N		x
Tritogonia verrucosa	Buckhorn	THR		x
Tympanuchus phasianellus	Sharp-tailed Grouse	SC/M		x
Williamsonia lintneri	Ringed Boghaunter	SC/N		x

Key:

State Status

END endangered
THR threatened
SC special concern
SC/P fully protected
SC/N no laws regulating use, possession, or harvesting
SC/H take regulated by establishment of open closed seasons
SC/FL federally protected as endangered or threatened, but not so designated by WDNR
SC/M fully protected by federal and state laws under the Migratory Bird Act.

Federal Status

LE listed endangered
C candidate for future listing

ENDANGERED OR THREATENED SPECIES AND SPECIES OF SPECIAL CONCERN

Plants

The table below lists plants on the Black River State Forest which are endangered, threatened or of special concern, based on the Natural Heritage Inventory (NHI) database.

Scientific Name	Common Name	State Status
Asclepias ovalifolia	Dwarf Milkweed	THR
Bartonia paniculata	Twining Screwstem	SC
Bartonia virginica	Yellow Screwstem	SC
Callitriche heterophylla	Large Water-starwort	THR
Carex assiniboinensis	Assiniboine Sedge	SC
Carex cumulata	Clustered Sedge	SC
Carex folliculata	Long Sedge	SC
Carex straminea	Straw Sedge	SC
Diarrhena obovata	Beak Grass	END
Epilobium palustre	Marsh Willow-herb	SC
Huperzia porophila	Rock Clubmoss	SC
Juncus marginatus	Grassleaf Rush	SC
Myriophyllum farwellii	Farwell's Water-milfoil	SC
Oryzopsis canadensis	Canada Mountain-ricegrass	SC
Platanthera hookeri	Hooker Orchis	SC
Poa paludigena	Bog Bluegrass	THR
Polygala cruciata	Crossleaf Milkwort	SC
Potamogeton diversifolius	Water-thread Pondweed	SC
Rhexia virginica	Virginia Meadow-beauty	SC
Scirpus georgianus	Georgia Bulrush	SC
Scleria triglomerata	Whip Nutrush	SC
Solidago sciaphila	Shadowy Goldenrod	SC
Talinum rugospermum	Prairie Fame-flower	SC
Thelypteris simulata	Bog Fern	SC
Utricularia geminiscapa	Hidden-fruited Bladderwort	SC
Viola fimbriatula	Sand Violet	END

Key:

State Status

END endangered

THR threatened

SC special concern

ENDANGERED OR THREATENED SPECIES AND SPECIES OF SPECIAL CONCERN

APPENDIX C. WILDLIFE SPECIES OF GREATEST CONSERVATION NEED

The following tables list vertebrate Species of Greatest Conservation Need (SGCN) associated with natural community types that are present on the Black River State Forest. Only SGCN with a high or moderate probability of occurring in the Central Sand Plains Ecological Landscape are shown. Numbers indicate the degree to which each species is associated with a particular habitat type (3=significant association, 2=moderate association, and 1=low association). Species-community combinations assigned either "3" or "2" in the table are also Ecological Priorities, as defined by the Wisconsin Wildlife Action Plan. See dnr.wi.gov/org/land/er/WWAP/ for more information.

MAJOR* OPPORTUNITIES TO SUSTAIN THE NATURAL COMMUNITIES EXIST IN THE CENTRAL SAND PLAINS

	Alder Thicket	Central Sands Pine - Oak Forest	Dry Cliff	Floodplain Forest	Impoundments/Reservoirs	Northern Sedge Meadow	Northern Wet Forest	Oak Barrens	Open Bog	Pine Barrens	Sand Prairie	Shrub Carr	Southern Dry-mesic Forest	Surrogate Grasslands	White Pine - Red Maple Swamp
Species Name	**Species that are Significantly Associated with the Central Sand Plains Landscape**														
American Bittern	1					3			3			1		1	
American Woodcock	3	1		1		1	1	1	1	1		3		1	1
Bald Eagle				1	3										
Black Tern					2	2									
Black-billed Cuckoo	3			2		1	1	2		2		3			
Blanding's Turtle	2			2	3	2		3		3	3	2	2		
Blue-winged Teal				2	2	2					1			2	
Blue-winged Warbler		1		2				1				2	2		1
Bobolink						3			2					3	
Brown Thrasher								3		3	3			2	
Dickcissel								1						3	
Eastern Meadowlark											2			3	
Field Sparrow								2		2	3			2	
Four-toed Salamander	3			3		2	2		3			3			
Franklin's Ground Squirrel								3		3	3			2	
Golden-winged Warbler	3	1					2		2	1		3	1		1
Grasshopper Sparrow								2		1	3			3	
Gray Wolf (aka Timber Wolf)	3	3		2		1	3	2	2	2		2	2		1
Greater Prairie-Chicken						2					1	1		3	
Henslow's Sparrow						1			2					3	
Lake Sturgeon					3										
Least Flycatcher		1		2								1	1		1
Lesser Scaup					2										
Mudpuppy					3										
Northern Harrier	1					3		2	2	2	1	1		3	
Osprey					3										

MAJOR* OPPORTUNITIES TO SUSTAIN THE NATURAL COMMUNITIES EXIST IN THE CENTRAL SAND PLAINS

	Alder Thicket	Central Sands Pine - Oak Forest	Dry Cliff	Floodplain Forest	Impoundments/Reservoirs	Northern Sedge Meadow	Northern Wet Forest	Oak Barrens	Open Bog	Pine Barrens	Sand Prairie	Shrub Carr	Southern Dry-mesic Forest	Surrogate Grasslands	White Pine - Red Maple Swamp
Species Name	**Species that are Significantly Associated with the Central Sand Plains Landscape (Continued)**														
Prothonotary Warbler				3											
Red-headed Woodpecker		2		2				2		1			2		
Red-shouldered Hawk				3									2		2
Short-billed Dowitcher					2										
Short-eared Owl						2			1		1	2		3	
Trumpeter Swan					2	1			1						
Upland Sandpiper						1		2		2	2			3	
Veery	3			2			2					3	2		3
Vesper Sparrow								3		3	3			1	
Western Meadowlark								2		1	2			3	
Western Slender Glass Lizard								3		3	3				
Whip-poor-will		3		1				2		2			3		
Whooping Crane						2			2						
Willow Flycatcher				1							1	3		2	
Wood Thrush		1		2			1						3		1
Wood Turtle	3			3		2	2	3		3	3	3			
Yellow-billed Cuckoo				3								2	2		1
	Species that are Moderately Associated with the Central Sand Plains Landscape														
American Golden Plover					2	1								2	
Bullsnake		2	3					3		3	3		2		
Canada Warbler	2	1					2					1			2
Canvasback					2										
Cerulean Warbler				3									3		
Connecticut Warbler							2		2	2					
Dunlin					2										
Eastern Massasauga Rattlesnake	3			3				3	3	3	3	3			
Eastern Red Bat	2	2		2	1	2	2	2	2	1		2	2		2
Hoary Bat	2	2		2	1	2	2		2			2	1		2
Hudsonian Godwit					1										
King Rail						1									
Lark Sparrow								3		2	3				
Le Conte's Sparrow						3			2					3	
Louisiana Waterthrush													3		

WILDLIFE SPECIES OF GREATEST CONSERVATION NEED

MAJOR* OPPORTUNITIES TO SUSTAIN THE NATURAL COMMUNITIES EXIST IN THE CENTRAL SAND PLAINS

	Alder Thicket	Central Sands Pine - Oak Forest	Dry Cliff	Floodplain Forest	Impoundments/Reservoirs	Northern Sedge Meadow	Northern Wet Forest	Oak Barrens	Open Bog	Pine Barrens	Sand Prairie	Shrub Carr	Southern Dry-mesic Forest	Surrogate Grasslands	White Pine - Red Maple Swamp
Species Name	**Species that are Moderately Associated with the Central Sand Plains Landscape (Continued)**														
Midland Smooth Softshell Turtle															
Northern Goshawk															2
Northern Long-eared Bat	2	2		2	1	2	1	2	2			2	2		2
Pickerel Frog	2			2	3	3	2		2			2			
Prairie Ringneck Snake		2						2			2		2		
Prairie Vole								2		1	3			2	
Red Crossbill		1					1			2					
Red-necked Grebe															
River Redhorse															
Rusty Blackbird	2			3					2			2			1
Sharp-tailed Grouse						2		3	1	3		1		2	
Silver-haired Bat	2	2		2	1	2	2		2			2	1		2
Solitary Sandpiper	1			3		1			2			1			
Water Shrew	2			2	1	1	3		1			1			1
Western Sand Darter															
White-tailed Jackrabbit								1		1	3			2	
Wilson's Phalarope						3									
Yellow Rail						3			3						
Yellow-bellied Racer			2					2		2	3		2		

**Major: A major opportunity for sustaining the natural community in the Ecological Landscape exists, either because many significant occurrences of the natural community have been recorded in the landscape or major restoration activities are likely to be successful maintaining the community's composition, structure, and ecological function over a longer period of time.*

IMPORTANT* OPPORTUNITIES MAY EXIST TO SUSTAIN THE NATURAL COMMUNITY IN THE CENTRAL SAND PLAINS

	Coastal Plain Marsh	Coldwater streams	Coolwater streams	Dry Prairie	Dry-mesic Prairie	Emergent Marsh	Moist Cliff	Northern Dry Forest	Northern Dry-mesic Forest	Northern Hardwood Swamp	Northern Mesic Forest	Southern Dry Forest	Southern Mesic Forest	Southern Sedge Meadow	Southern Tamarack Swamp (rich)	Submergent Marsh	Warmwater rivers	Warmwater streams
Species Name	**Species that are Significantly Associated with the Central Sand Plains Landscape**																	
American Bittern						3								2				
American Woodcock								1	1	2	2	1			2			
Bald Eagle																2	3	
Black Tern						3								1		2		
Black-billed Cuckoo								1	1	1	2				2			
Blanding's Turtle	2	2	2	3	2	3							2	2	2	3	2	2
Blue-winged Teal	1			1	2	3								2		2	1	
Blue-winged Warbler								1				2	2		2			
Bobolink					3									2				
Brown Thrasher				2	2			1										
Dickcissel				1	3													
Eastern Meadowlark				2	3									2				
Field Sparrow				3	2													
Four-toed Salamander		2	2			3	1			2	3		3	2	2			
Franklin's Ground Squirrel				1	3													
Golden-winged Warbler								2	2	2	2	1	1		1			
Grasshopper Sparrow				3	3													
Gray Wolf (aka Timber Wolf)								2	3	2	3	2	2		1			
Greater Prairie-Chicken				2	3									2				
Henslow's Sparrow					3									1				
Lake Sturgeon																	3	
Least Flycatcher								2	2	2	3	1	1					
Lesser Scaup						1										3	2	
Mudpuppy		2	1														3	
Northern Harrier				2	2	1								2				
Osprey																1	3	
Prothonotary Warbler																		
Red-headed Woodpecker								1	1			2						
Red-shouldered Hawk								1	2	1	2		2		1			
Short-billed Dowitcher						3										1		
Short-eared Owl				2	2	1								2				
Trumpeter Swan						3										3	1	
Upland Sandpiper				3	3									1				
Veery								1	2	3	2		2		1			

WILDLIFE SPECIES OF GREATEST CONSERVATION NEED

IMPORTANT* OPPORTUNITIES MAY EXIST TO SUSTAIN THE NATURAL COMMUNITY IN THE CENTRAL SAND PLAINS

	Coastal Plain Marsh	Coldwater streams	Coolwater streams	Dry Prairie	Dry-mesic Prairie	Emergent Marsh	Moist Cliff	Northern Dry Forest	Northern Dry-mesic Forest	Northern Hardwood Swamp	Northern Mesic Forest	Southern Dry Forest	Southern Mesic Forest	Southern Sedge Meadow	Southern Tamarack Swamp (rich)	Submergent Marsh	Warmwater rivers	Warmwater streams
Species Name	**Species that are Significantly Associated with the Central Sand Plains Landscape (Continued)**																	
Vesper Sparrow				3	2													
Western Meadowlark				2	3													
Western Slender Glass Lizard				3	3													
Whip-poor-will								2	2		1	3	1					
Whooping Crane						3								2		3		
Willow Flycatcher				1	2									2	1			
Wood Thrush									1	1	2	2	3		1			
Wood Turtle		3	3	3	2					2	3		2	2		3	3	3
Yellow-billed Cuckoo											1	1	2		1			
	Species that are Moderately Associated with the Central Sand Plains Landscape																	
American Golden Plover					2	2								1				
Bullsnake				3	3							2	2					
Canada Warbler								1	2	3	2				1			
Canvasback						1										3	3	
Cerulean Warbler											1	1	2					
Connecticut Warbler								3	1									
Dunlin						2											2	
Eastern Massasauga Rattlesnake				3	3	3								3				
Eastern Red Bat	2	3	3			2		2	2	2	2	2	2	2	1	2	2	2
Hoary Bat	2	3	3			2		2	2	2	2	1	1	2	1	2	2	2
Hudsonian Godwit						3										1		
King Rail						3								2				
Lark Sparrow				2														
Le Conte's Sparrow																		
Louisiana Waterthrush		3	3										3					
Midland Smooth Softshell Turtle																	3	
Northern Goshawk								1	2	1	3							
Northern Long-eared Bat	2	3	3			2		2	2	2	2	2	2	2		2	2	2
Pickerel Frog		3	3			3					2		2	3		3	3	3
Prairie Ringneck Snake				3	3							2						
Prairie Vole				3	3													
Red Crossbill								3	3		1							
Red-necked Grebe						3										2		

IMPORTANT* OPPORTUNITIES MAY EXIST TO SUSTAIN THE NATURAL COMMUNITY IN THE CENTRAL SAND PLAINS

	Coastal Plain Marsh	Coldwater streams	Coolwater streams	Dry Prairie	Dry-mesic Prairie	Emergent Marsh	Moist Cliff	Northern Dry Forest	Northern Dry-mesic Forest	Northern Hardwood Swamp	Northern Mesic Forest	Southern Dry Forest	Southern Mesic Forest	Southern Sedge Meadow	Southern Tamarack Swamp (rich)	Submergent Marsh	Warmwater rivers	Warmwater streams
Species Name	**Species that are Moderately Associated with the Central Sand Plains Landscape (Continued)**																	
River Redhorse																	2	
Rusty Blackbird						2									2			
Sharp-tailed Grouse				2	2													
Silver-haired Bat	2	3	3			2		2	2	2	2	1	1	2	1	2	2	2
Solitary Sandpiper	2	2	2			3								1				2
Water Shrew		3	3							3	2		2		1		1	2
Western Sand Darter																	2	
White-tailed Jackrabbit				3	3													
Wilson's Phalarope						3								1		2		
Yellow Rail																		
Yellow-bellied Racer				3	2							2						

**Important: Although the natural community does not occur extensively or commonly in the Ecological Landscape, one to several occurrences do occur and are important in sustaining the community in the state. In some cases, important opportunities may exist because the natural community may be restricted to just one or a few Ecological Landscapes within the state and there may be a lack of opportunities elsewhere.*

WILDLIFE SPECIES OF GREATEST CONSERVATION NEED

NATURAL COMMUNITY IS PRESENT* IN THE CENTRAL SAND PLAINS

	Bedrock Glade	Calcareous Fen	Cedar Glade	Emergent Marsh - Wild Rice	Hemlock Relict	Inland lakes	Mesic Prairie	Oak Woodland	Pine Relict	Wet Prairie	Wet-mesic Prairie
Species Name	**Species that are Significantly Associated with the Central Sand Plains Landscape**										
American Bittern				1						1	
American Woodcock		2								1	
Bald Eagle				1		3					
Black Tern				2		2					
Black-billed Cuckoo										1	
Blanding's Turtle			2	3		3	2	2		3	2
Blue-winged Teal				2		2	2			2	2
Blue-winged Warbler	2							2			
Bobolink		1					3			3	3
Brown Thrasher										1	
Dickcissel							3				1
Eastern Meadowlark		1					3			1	2
Field Sparrow			3				2				2
Four-toed Salamander											
Franklin's Ground Squirrel							2	2		1	2
Golden-winged Warbler											
Grasshopper Sparrow			1				1				
Gray Wolf (aka Timber Wolf)					1				1		
Greater Prairie-Chicken							3			2	3
Henslow's Sparrow							3			2	2
Lake Sturgeon						3					
Least Flycatcher								1			
Lesser Scaup				2		2					
Mudpuppy						3					
Northern Harrier		1		1			3			2	3
Osprey				1		3					
Prothonotary Warbler											
Red-headed Woodpecker								3			
Red-shouldered Hawk											
Short-billed Dowitcher											
Short-eared Owl							3			2	3
Trumpeter Swan				3		2					
Upland Sandpiper							2			2	2

NATURAL COMMUNITY IS PRESENT* IN THE CENTRAL SAND PLAINS

	Bedrock Glade	Calcareous Fen	Cedar Glade	Emergent Marsh - Wild Rice	Hemlock Relict	Inland lakes	Mesic Prairie	Oak Woodland	Pine Relict	Wet Prairie	Wet-mesic Prairie
Species Name	**Species that are Significantly Associated with the Central Sand Plains Landscape (Continued)**										
Veery					2			1	2		
Vesper Sparrow											
Western Meadowlark							1			1	
Western Slender Glass Lizard											
Whip-poor-will	2				1			3	2		
Whooping Crane											
Willow Flycatcher		2					2			2	2
Wood Thrush								2			
Wood Turtle								2		2	
Yellow-billed Cuckoo								1			
	Species that are Moderately Associated with the Central Sand Plains Landscape										
American Golden Plover							2			2	2
Bullsnake	3		3				2	3	2		
Canada Warbler					2				2		
Canvasback				2		2					
Cerulean Warbler								2			
Connecticut Warbler											
Dunlin											
Eastern Massasauga Rattlesnake		3					3			3	3
Eastern Red Bat		2	1		2	2		2	2		
Hoary Bat		2	1		2	2		1	2		
Hudsonian Godwit											
King Rail											
Lark Sparrow			3								
Le Conte's Sparrow										2	2
Louisiana Waterthrush											
Midland Smooth Softshell Turtle											
Northern Goshawk											
Northern Long-eared Bat		2	1		2	2		2	1		
Pickerel Frog		2				2	2			3	3
Prairie Ringneck Snake	3		3					2			
Prairie Vole							2				
Red Crossbill					1				2		

WILDLIFE SPECIES OF GREATEST CONSERVATION NEED

NATURAL COMMUNITY IS PRESENT* IN THE CENTRAL SAND PLAINS

	Bedrock Glade	Calcareous Fen	Cedar Glade	Emergent Marsh - Wild Rice	Hemlock Relict	Inland lakes	Mesic Prairie	Oak Woodland	Pine Relict	Wet Prairie	Wet-mesic Prairie
Species Name	**Species that are Moderately Associated with the Central Sand Plains Landscape (Continued)**										
Red-necked Grebe				1							
River Redhorse											
Rusty Blackbird		2									
Sharp-tailed Grouse							1			1	1
Silver-haired Bat		2	1		2	2		1			
Solitary Sandpiper											
Water Shrew						2					
Western Sand Darter											
White-tailed Jackrabbit							1				
Wilson's Phalarope										1	
Yellow Rail											
Yellow-bellied Racer			3								

**Present: The natural community occurs in the Ecological Landscape, but better management opportunities appear to exist in other parts of the state.*

APPENDIX D. GLOSSARY OF TERMS

Active Management: These areas apply primarily in the forest production areas and use general forest management prescriptions. Activities are achieved through clearcutting, selective cutting, thinning, timber stand improvement, natural or forced regeneration, herbicide treatments, and/or prescribed burning. These activities would be consistent with standard silvicultural practices associated with the forest timber types found in the area and are generally scheduled in the property's reconnaissance (inventory). Each management area will have a goal and objective consistent with site capabilities and forest cover types. While species composition would remain relatively consistent during the life of the master plan, the age class distribution would change due to timber harvesting. Forest users should expect to see ongoing annual vegetation manipulation.

Adaptive Management: A dynamic approach to forest management in which the effects of treatments and decisions are continually monitored and used, along with research results, to modify management on a continuing basis to ensure that objectives are being met.

Basal Area: The basal area of a tree is usually defined as the cross-sectional area at breast height in square feet.

Biological Diversity: The variety and abundance of species, their genetic composition, and the communities, ecosystems and landscapes in which they occur. Biological diversity also refers to the variety of ecological structures, functions, and processes at any of these levels.

Community Restoration: The practice of community restoration recognizes that communities, species, structural features, microhabitats, and natural processes that are now diminished or absent from the present landscape have a valuable role to place in maintaining native ecosystems. Under some definitions, community restoration means moving the current composition and structure of a plant community to a composition and structure that more closely resembles that of the presettlement vegetation.

DNR Silviculture and Forest Aesthetics Handbook: Silviculture is the practice of controlling forest composition, structure, and growth to maintain and enhance the forest using a unified, systematic approach. The management recommendations are basic guidelines intended to encourage vigor within all developmental stages of a forest, whether managed in an even-age or uneven-age system. The practice of silviculture is an art and a science which recognizes the specific ecological capabilities and characteristics of the site for both short-term and long-term impacts. Integrated resource management objectives, such as aesthetics, wildlife, endangered resources, biological diversity, timber production, and the protection of soil and water quality are part of this system.

DNR Old Growth and Old Forests Handbook: These management recommendations provide basic, adaptive guidelines based on research and general scientific and silvicultural knowledge of the species being managed. The recommendations are subject to purposeful, on-the-ground modification by the land manager. Old growth forests are rare in Wisconsin and are valued for many ecological, social, and economic purposes. Current forests will change with time, and can provide an opportunity to restore old growth forests at the stand level, and in some places at a landscape scale. The Department of Natural Resources formally recognized and encouraged the management of old growth forests in Wisconsin's Biodiversity as a Management Issue. Wisconsin's state land master planning process, formalized in Chapter NR 44, Wis. Adm. Code, includes old growth forest as a critical consideration.

Driftless Area: The unglaciated area of southwestern Wisconsin, southeastern Minnesota, and northeastern Iowa generally characteristic of a steep "ridge and coulee" topography.

Extended Rotation Stands: Stands that can be either even or uneven aged. They are managed well beyond the economic rotation to capture ecological benefits associated with mature forests. These stands are carried beyond their normal economic rotation age and are harvested before reaching pathological decline.

Forest Cover Type: A category of forest usually defined by its vegetation, particularly its dominant vegetation as based on percentage cover of trees.

Forest Structure: A category of forest usually defined by its vegetation, particularly its dominant vegetation as based on percentage cover of trees.

Invasive Species: These species have the ability to invade natural systems and proliferate, often dominating a community to the detriment and sometimes the exclusion of native species. Invasive species can alter natural ecological processes by reducing the interactions of many species to the interaction of only a few species.

GLOSSARY OF TERMS

Managed Old Forest: Designated forests (relict, old growth, or old forests) where future active management is limited, and the primary management goal is the long-term development and maintenance of some old growth or old forest ecological attributes within environments where limited management practices and product extraction are allowed.

Managed Old Growth: The primary management goal is the long-term development and maintenance of old growth characteristics within environments where limited but active land management, including logging is allowed. Practices which could be considered include insect control, salvage logging, prescribed fire, and prescribed logging.

Passive Management: A management technique that means the goals of the native community management area are achieved primarily without any direct action. Nature is allowed to determine the composition and structure of the area. For example, patches of large woody debris and the accompanying root boles (tip-up mounds) that are characteristic of old growth structure are best achieved through natural processes. Passive management, however, does not mean a totally hands off approach. Some actions are required by law, such as wildfire suppression, consideration of actions when severe insect and disease outbreaks affect trees, and hazard management of trees along trails and roads. Other actions, such as removal of invasive exotic species, are necessary to maintain the ecological integrity of the site.

State Natural Areas: Tracts of land or water harboring natural features that have escaped most human disturbance and that represent the diversity of Wisconsin's native landscape. They contain outstanding examples of native biotic communities and are often the last refuges in the state for rare and endangered plant and animal species. They may also contain exceptional geological or archaeological features. The finest of the state's natural areas are formally designated as State Natural Areas.

Sustainable Forestry: The practice of managing dynamic forest ecosystems to provide ecological, economic, social, and cultural benefits for present and future generations.

Type 1 Recreational Use Setting: Objective of this setting is to provide a remote, wild area where the recreational user has opportunities to experience solitude, challenge, independence and self-reliance.

Type 2 Recreational Use Setting: Objective of this setting is to provide a remote or somewhat remote area with little development and a predominantly natural-appearing environment offering opportunities for solitude and primitive, non-motorized recreation.

Type 3 Recreational Use Setting: Objective of this setting is to provide readily accessible areas with modest recreational facilities offering opportunities at different times and places for a variety of dispersed recreational uses and experiences.

Type 4 Recreational Use Setting: Objective of this setting is to provide areas offering opportunities for intensive recreational use activities and expectations. Facilities, when present, may provide a relatively high level of user comfort, convenience and environmental protection.

APPENDIX E. REFERENCES

Avers, P.E., D.T. Cleland and W.H. McNab. 1994. National Hierarchical Framework of Ecological Units. Pp 48-61. In L.H. Foley, ed. Silviculture: from the Cradle of Forestry to the Ecosystem Management, Proceedings of the National Silviculture Workshop, 1993, November 1-4. USDA, Forest Service, Southeastern Forest Experiment Station (Gen. Tech. Rpt. SE-88). Asheville, NC.

Black River Area Chamber of Commerce. 2006. Black River Country Wisconsin. 45pp.

Curtis, J.T. 1959. The Vegetation of Wisconsin. University of Wisconsin Press, Madison, WI. 657pp.

Miles, Patrick D. Dec-18-2006. Forest inventory mapmaker web-application version 2.1. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. [Available only on internet: www.ncrs2.fs.fed.us/4801/fiadb/index.htm]

Mississippi River Regional Planning Commission. 2001. Mississippi River Regional Planning Commission Industry Cluster and Regional Trade Report. US Dept. of Commerce-Economic Development Administration. Project N. 06-86-0430. Chap. 4.

Mississippi River Regional Planning Commission. 2005. 2005 Comprehensive Economic Development Strategy.

Natural Heritage Inventory Program. 2005. Biotic Inventory and Analysis of the Black River State Forest/Meadow Valley Landscape. Bureau of Endangered Resources. Department of Natural Resources. PUBL ER-805 2005.

State of Wisconsin. 2005. Jackson County Workforce Profile. Department of Workforce Development. Office of Economic Advisors. OEA-10619-P

U.S. Census Bureau. 2001. "Census 2000 Redistricting Data Summary File" for Wisconsin on CD-ROM released March 2001.

Wisconsin Department of Natural Resources. 1968. Surface Water Resources of Jackson County. WDNR, Madison WI.

Wisconsin Department of Natural Resources. 1995. Wisconsin's Biodiversity as a Management Issue: A Report to Department of Natural Resources Managers. Wisconsin DNR, Madison. 240pp.

Wisconsin Department of Natural Resources. 1999. Ecological Landscapes of Wisconsin Handbook. WDNR, Madison, WI.

Wisconsin Department of Natural Resources. 1999. Wisconsin's Northern State Forest Assessments: Regional Ecology. WDNR, Madison, WI.

Wisconsin Department of Natural Resources. 2000. Wisconsin Forests at the Millennium: An Assessment. Publication PUB-FR-161 2000. 125pp

Wisconsin Department of Natural Resources. 2000. Fisheries, Wildlife, and Habitat Management Plan for Wisconsin 2001 - 2007, June 2000 Version.

Wisconsin Department of Natural Resources. 2000. Wisconsin Statewide Karner Blue Butterfly Habitat Conservation Plan and Environmental Impact Statement. Wisconsin Department of Natural Resources. Madison, WI. PUBL-SS-947-00. 74pp

Wisconsin Department of Natural Resources. 2001. Wisconsin's Northern State Forest Assessments: Recreational Supply and Demand. WDNR, Madison, WI.

Wisconsin Department of Natural Resources. 2003. Recreational Assessment of the Black River State Forest Region. WDNR, Madison, WI.

Wisconsin Department of Natural Resources. 2003. Wisconsin's Forestry Best Management Practices for Water Quality: Field Manual for Loggers, Landowners and Land Managers. PUB-FR-093-2003. 76pp.

Wisconsin Department of Natural Resources. 2004. Black River State Forest. PUB-FR-154 2004

Wisconsin Department of Natural Resources. 2004. Ecological Landscapes of Wisconsin Handbook 1805.1. http://www.dnr.state.wi.us/landscapes/

Wisconsin Department of Natural Resources. 2005. Black River State Forest Gypsy Moth Management Plan. (Prepared by Bria Radtke, May 2005).

Wisconsin Department of Natural Resources. 2005. Wisconsin's Strategy for Wildlife Species of Greatest Conservation Need. PUB-ER-641-2005. (aka Wisconsin's Wildlife Action Plan)

REFERENCES

Wisconsin Department of Natural Resources. 2006. Wisconsin Land Legacy Report: An inventory of places to meet Wisconsin's future conservation and recreation needs. 232 pp. plus appendices.

Wisconsin Department of Natural Resources. 2006. Wisconsin Statewide Comprehensive Outdoor Recreation Plan 2005-2010.

Wisconsin Department of Natural Resources. 2007. Silviculture and Forest Aesthetics Handbook 2431.5.

Wisconsin Department of Natural Resources. 2008. Old Growth and Old Forests Handbook 2480.5.

Wisconsin Department of Transportation. 2000. Profile of Visitors on the Bike Trails of Western Wisconsin.

Wisconsin Department of Transportation. 2006. Economic Impact of Expenditures by Travelers on Wisconsin Calendar Year 2005.

Wyenberg, Michelle. 2006. Jackson and Clark Counties Awarded $32,800 Tourism Grant. Jackson County Chronicle. November 3, 2006.